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The Surgical Treatment of Colics in Animals*

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I AM using this title, for want of a better one, to present a brief review of the available forms of instrumentation useful in the management of gastric and intestinal obstructions of animals, and I trust you will not be deceived by the startling title—"The surgical treatment of colics," which might easily be mistaken for more than I shall be able to disclose as rational treatment of a surgical character for intestinal and gastric ailments. Let me therefore first announce that this epitome is not a startling proclamation about the invasion of intestinal diseases through the abdominal wall. On the contrary, as Prof. Hobday has told you, and as Doctor Blattenburg has warned you, I shall repeat, that we are not today and probably never shall be able to invade the abdominal viscera to any great extent.

One of my objects is to draw attention to the necessity of diagnosing abdominal diseases at an early stage with more certainty in order that we may attack them with a therapy directed precisely at the affected part. Colic, I dare say, in veterinary practice is too frequently treated as such. I have often thought if the word colic had never entered our nosology we would then have approached abdominal pain with more searching inquiry as to the nature of causative condition and then all of these years we should have been treating causes instead of eternally seeking medicant to cure the effect. Colic in animals has usually been considered as a mild, or overwhelming abdominal pain, as the case may be, and too little attention has been paid to the underlying cause. Our weakest point in the management of colics is our inability to diagnose the cause of and the seat of the ailment, at a stage early enough to put direct, effectual treatment into operation before it is too late.

The conventional treatment of almost all colics is the administration of a pain-relieving potion, and then, if this is not followed by a cessation of the pain, an evacuant is thought necessary. When these two fail the patient dies. The pain-killers are usually morphine, cannabis indica or chloral and the evacuant anything from a hypodermic injection of violent eserine, arecoline or pilocarpine to a large drench of linseed or castor oil. In addition to the foregoing, when there is bloating, carminatives and antiferments are given and if the bloat is threatening a trocar and canula are thrust into the right flank. This, with a few variations in the selection of drugs, constitutes, with most of us, the standard treatment of colics today, and these treatments are so strictly conventional that almost anyone of ordinary intelligence could master the entire system after a few days of instruction. In fact

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we all know of "handy" fellows in veterinary hospitals and large establishments who manage colics quite up to the prevailing standards.

This is not as it should be in this day of sane therapeutics. We should accept now the burden of studied observations, on our patients sick from abdominal diseases with a view to determining the exact nature of the condition responsible for the pain. Autopsy after autopsy held on animals dead from colics shows, too often, how wide of the mark our treatment had been and how useless were our efforts to turn the tide toward a recovery if we did succeed at a late stage to discover the cause. Very often these postmortem investigations show that a vigorous attack at the affected spot right from the beginning might have been effective. By exclusion, we do sometimes, after a patient has suffered for some time, make a correct diagnosis but then it is usually too late to effect a cure. In short such cases are already beyond hope and out of reach of any treatment when the diagnosis is made.

The better management of abdominal diseases must come through an intensive study of symptoms and groups of symptoms coupled with probable causes which will enable us to determine early in the march of the disease the exact seat and the exact nature of the trouble.

Abdominal Pains Misleading

Abdominal pains are, to say the least, very misleading I must admit. Even in human beings, where the symptoms are subjective, grave errors are often made by the treachery of pain. For example a patient with an attack of appendicitis may complain of pain in the left loin or over the solar plexus. The location of pain, in fact, gives no assurance that the lesion is at the same point. So misleading are these expressed manifestations that only the specialist seems able to properly interpret them. In animal patients we may actually be thankful to be rid of this group of subjective symptoms. In truth we are at no loss whatever in diagnosing the seat of abdominal pain for want of them. I am certain after many observations covering a good many years amongst animals sick with colics that the objective symptoms presented by animals if properly studied and if properly grouped and then coupled with the probable cause can be depended upon as fairly diagnostic of special conditions even in the early stages of painful abdominal diseases. And it is largely in this direction we must turn our attention if we would arrive at that "refinement of diagnosis" upon which all sound treatment must be based. In short we are now face to face with the problem of differentiating as to exact location and cause, pain in the alimentary canal within the abdomen. Pain in the stomach should be differentiated from pain in the colon and either should be distinguished from pain in the small bowels, and so on, at a very early stage of the colic. With these difficulties out of the way the treatment of colics would at once be simplified into a more effectual attack upon the actual trouble. And while I admit that perfection in making these differentiations need not be expected it is only by developing a more inquisitive disposition toward these phenomena that we may ever hope to become sufficiently proficient to bring our treatment of intestinal obstruction up to a worthy standard of excellence.

Inspection and Palpation

In addition to the manifestations of pain there are other valuable resources upon which one may rely. Inspection of the abdomen often aids materially in arriving at positive conclusions as to the seat of the trouble and while deep abdominal pressure, depended upon so much by doctors of human medicine, is of service only in small animals, we have in large animals the advantage of exploration per rectum which will yield a great wealth of diagnostic information to anyone who will but practice diligently this method of searching for abnormalties. To the unskilled hand all rectal explorations are alike, but the hand of the experienced diagnostitian is capable of making wonderfully accurate deductions from what he palpates. In the earlier days of my career as a practitioner I doubted the

possibility of recognizing a twisted colon, but after having read positive statements, to this effect, from others, especially European writers, I became more inquisitive and finally discovered that torsion of the colon is not only easy to diagnose but the exact direction of the twist even can be determined with precision. And so it is with other conditions if we would but search for them more often than we are in the habit of doing. The rectal and vaginal routes offer a wide field for explorations which are fruitful or useless in accordance to the training the hand that makes them has received. The condition of the large colon, the small colon, the cecum, the inguinal rings, the kidneys, the uterus and of the ovaries can be determined by these manipulations. Impactions, growths, cysts, calculi, torsions, and abscesses can be diagnosed in this manner. Why then wait for the autopsy for a diagnosis with this wide open route available during life?

Then again we may take advantage of exploratory punctures and stomach cathetrizations in many instances to determine more accurately the nature of alimentary disorders of an acute character.

This paper is not designed to be a discourse on diagnosis, but I can not very well introduce my subject as logical without first showing the possibility of locating the seat and cause of abdominal pain with a degree of accuracy that would warrant the recommendation of treatment by instrumentation. A surgical operation is justified only when directed at a definite object and when this object can not be located accurately then the surgeon must leave the condition in the therapeutist's category. On this account the following remarks deal at some length with the diagnosis of the condition the operation is intended to cure.

ACUTE PAINFUL DISEASES OF THE STOMACH

The stomach of animals is subject to the following disorders which cause acute pain:

1. Overloading of the stomach of work horses, almost universally called "acute indigestion" in this country.
2. Impaction of the stomach of horses.
3. Acute gastritis of horses.
4. Acute dilatation of the stomach of horses.
5. Overloading of the rumen of ruminants.
6. Impaction of the rumen of ruminants.
7. Foreign bodies in the stomach of dogs and cats.
8. Foreign bodies in the rumen.

It will be noticed here that without going beyond the stomach we already find eight definite disorders each of which I shall endeavor to show belongs to the list of surgical diseases. Some of them may yield to medical treatment and when of a mild type may still properly remain in the list of medical diseases, but when they are grave the aid of the surgeon must be enlisted or the patient will not survive. Let us analyze them separately.

Overloading of the Stomach of Work Horses

Acute indigestion, so-called, is so well known to all practitioners that its symptoms need no special description here. It is so characteristic and its characteristics are so well known that there is little chance to mistake it for any other disorder. Esophageal obstruction (choke) in the very first stage and poisoning with aconite are the only two conditions for which it might by any chance be mistaken and these are very easily excluded by a little study. The eructations of gas, the activity of the esophagus in the cervical region, the distended abdomen which may be slight or threatening, the coliky pains of a fairly acute character, occurring in a horse after a day's work, sometimes before and sometimes after having eaten the evening meal is a clinical picture that is at once recognized as an overloaded stomach. The volume of water and feed is too great for the exhausted stomach to handle. Gases pass readily from the stomach into the bowels and these too become bloated. In the more formidable cases large quantities of chyme are washed into the intestinal tract, until all of the bowels as far back as the floating colon is teeming with a fermenting process.

Treatment.—Mild cases may take a favorable turn without any treatment and

will usually respond to the administration of antiferments, of which salicylic acid, recommended by Quitman is probably the best, but when the attack is of a severe type only radical measures undertaken promptly will prevent a fatal termination. The radical measures to which I refer are cathetrization of the stomach and puncture of the colon if the bloating is threatening. Cathetrization of the stomach is practiced extensively in this country but in spite of its merits as a radical cure it has by no means been universally adopted as the standard intervention against an overloaded stomach, as it should have been long ago. Here is an operation that goes to the "fountain-head" of the trouble and without ceremony removes it from the body. To fight a stubborn fermentation in such a mass of chyme and then start the whole volume through its long course to the rectum by means of drugs seems criminal with such a splendid operation available. Those who have practiced this operation have little patience with the uncertain and slow medical treatment. Stomach cathetrization not only evacuates the harmful contents but it also lowers the abdominal tension, and besides the dilution of the chyme with water controls the fermentation more effectually than any other form of antiferment treatment, and leaves what remains of the mass in a better physical condition for the intestines to handle. And often animals almost dead from acute indigestion, destined by medical treatment to go through a prolonged agony, followed by death or sometimes to end in laminitis, are cured immediately and ready for work in a few hours.

The Sequels of Stomach Cathetrization.—The sudden evacuation of the overwhelmed viscera particularly if the attack has been of several hours' duration may be followed by shock on resumption of the splanchnic circulation that had been dammed up by the pressure. It may be mild, serious, or even fatal, according as the causes and conditions of the patient chance to operate. An old subject or one systemically weak from continued hard work that has suffered two or three hours from an overloaded stomach if suddenly relieved will often begin to show symptoms of collapse from one-half hour to six hours after the operation. The weakened viscera, overcome by the prolonged stretching, take more than their share of the blood volume and this at the expense of the periphery. The result is shock; but this may very frequently be prevented by injecting large volumes of hot water into the stomach after the harmful contents have been removed. The sudden relief of a badly overwhelmed abdomen is a hazzard at all times when this precautionary treatment is omitted.

Laminitis is of course always liable to follow such a disorder and while cathetrization of the stomach does not always prevent it we have found that the instillation of alum, five ounces in solution, as a parting step of the operation is markedly preventive. In our practice stomach cathetrization has even been charged with causing laminitis, but the reason we had so many cases at first is due to the fact that before we practiced stomach cathetrization these bad cases died before laminitis could develop. When we began to prolong the life of these otherwise fatal cases we found that some of them fell victims to this complication. Now alum has come to our rescue. Alum for laminitis was first given, to my knowledge, by Doctor Douglas of New Orleans. Since he announced this remedy several years ago it has come into pretty general use in the West. I heard of it in California last winter where at least one veterinarian administers it in doses of one pound. A third sequel is *acute dilitation* of the stomach, of which I shall speak later.

Impaction of the Stomach

Impaction of the stomach is a condition I fear veterinarians have too frequently failed to recognize. It is invariably referred to as a senile trouble in our literature and is usually attributed to chronic dilatation of the stomach and in animals fed exclusively upon a dry fibrous forage.

While such is often the case under which the disease is encountered it is by no means limited to old animals. We have found numerous grave impactions in young, vigorous horses with great frequency.

Straw, hay, shredded fodder, coarse ensilage, alfalfa or even clover hay partaken of ravenously, is the usual cause. The cases in our urban practice are found chiefly among horses in small establishments where the food is carelessly or irradically allowed, that is a spare ration today and a liberal one tomorrow. In short, the hungry horse, after a day or two of hard work and privation, suddenly given access to a full manger, is found sick with colic the following morning, or falls sick in the harness during the next day.

The symptoms of this affection are characteristic. The pains are fairly acute and as the patient finds no comfort in the recumbent position—is continually up and down. There is always a marked perspiration about the neck and shoulders. The respirations are short and the nostrils widely dilated. Sometimes there is a grunt heard in the exhalations, particularly noticeable while the patient is recumbent. The absence of abdominal distention to account for this distressing respiration is in fact pathognonomic when coupled with the above symptoms. There may be some bloating of the right flank that becomes more pronounced as the disease progresses, but the bloating is never sufficient to account for the grave condition of the patient and only momentary relief is afforded when it is evacuated with the trocar and canula.

Treatment.—Allowed to run its course or under the usual medical treatment usually administered for colics, impaction of the stomach runs rapidly toward a fatal ending. Eserine, by further exhausting the stomach in the futile contractions to expel its contents, is always disastrous in impaction of the stomach and the same applies to the other powerful drugs resorted to for serious colics. Oil and purgatives afford no relief whatever.

The only remedy I have found to turn these fatal cases toward recovery is to patiently liquify the impacted mass and endeavor to aspirate it out through the tube. The operation requires patience, as this feat cannot be accomplished immediately. The injections of two or three gallons of water into the already full stomach may actually increase the patient's agony, but after a time when the water has had time to distribute itself through the mass, the injection of additional quantities of water will begin to bring out food particles in the reflux and finally, as the softening process continues, more will flow out. After patient attempt without success a second or third attempt may be made at intervals of an hour. As much as forty or fifty pounds of solids may thus be removed from the stomach and thus place an otherwise fatal case well toward recovery.

Such patients are however invalids for some time and are subject to subsequent attacks of colic, probably due to chronic dilatation.

Acute Gastritis

Acute gastritis is the most severe as well as the most fatal of colics if not promptly recognized and relieved. It is seen under two distinct circumstances. First after a hard day's work or long, tiresome journey, and, secondly, after eating tainted food. Sometimes these causes operate together. Ground foods containing poor qualities of corn, oats, barley and mill feed are responsible in many cases, particularly when there is a sudden change to these feeds.

The patient is stricken on the road or soon after having reached the stable and always before having eaten the evening meal. The patient suffers horrible agony and cannot be controlled, thrashing about in a terrifying manner. There is usually a threatening abdominal bloat that calls for immediate relief from the trocar and canula. This operation gives only a momentary comfort. Belching is not a constant symptom, although there is generally a perceptible activity of fluids in the esophagus. The respirations are accelerated, the nostrils dilated, the body bathed in perspiration, the temperature is elevated to 104° to 105° F. and the mucous membranes are highly injected. In hot weather the body temperature is sometimes very high as this disorder may be associated with overheating of the body.

Treatment.—The pathognomonic symptoms are found in the course of the treatment, which consists of the prompt washing

out of the stomach with the stomach tube and pump. The contents which usually flow out as soon as the tube reaches the cardiac orifice are blood stained with the exudates from the inflamed mucous membrane. It is sour and flows out in sufficient quantity to afford an immediate relief. As the tube enters the stomach the patient, till then in great agony, immediately stands quiet. The volume of solids evacuated from such a stomach is always small and can in no way account for the patient's agony. The extreme pain is the pain of inflammation and not entirely of engorgement as in acute indigestion. The stomach should be well washed out by alternate instillation and aspiration of hot water until the reflux is clear and then several gallons of hot water are injected to fill the stomach and guard against a too sudden reaction of the gastric circulation. In these cases we also use alum solution to prevent laminitis. One-half of a grain of strychnine is helpful, and in twenty hours a small dose of linseed oil is given to prevent the constipation that otherwise may follow two days later.

Acute Dilatation of the Stomach

Acute dilatation of the stomach is a sequel of the above disorders and is due to an exhaustion of the muscularis from the severe and especially from the prolonged stretching to which the stomach was subjected. In some instances the walls give way to the stretching and rupture occurs. Dilatations follow stomach colics in which there is little or no bloating in the bowels or when the bloat in the bowels is suddenly relieved by evacuation of the gases with the trocar and canula. As long as the stomach is pressed upon by bloated bowels its walls are supported against stretching or rupture, but when bloat is absent or is relieved it distends in a backward direction and either stretches into a serious dilatation or else gives way entirely. It is therefore important in treating overwhelmed stomachs to relieve the distention by catheterization and then if necessary attend to the gases in the large bowels. To reverse these operations is hazardous.

Every bad case of acute indigestion, impaction and gastritis is followed by more or less dilatation with which the surgeon in charge should reckon. In the vigorous subject, given prompt treatment of the proper kind, the stretched organ almost immediately resumes its normal state and is ready to functionate in the normal manner; in others the reaction requires several days and in some it runs rapidly to a fatal end or leaves the stomach a prey to frequent similar attacks and the patient a victim of chronic indigestion.

In order that I may not be misunderstood I should mention here that we use the phrase "dilatation of the stomach" to designate exclusively the stretched stomach that does not immediately contract after the material engorging it has been removed. The term is used by some, notably by Hutyra and Marek, as synonymous with engorgement of the stomach, whether the organ is damaged by the stretching or not, while here I am restricting its meaning to the more or less permanent damage done by the stretching. That is, dilatation of the stomach is that state in which the muscularis does not contract back to a normal state when the bloat is relieved.

The symptoms of dilatation vary from a delayed return of the patient's health after an attack of colic lasting several days, in mild cases, to the gravest symptoms of fatal shock in severe cases. A bad case of dilatation of the stomach following a severe stomach colic presents all of the symptoms of a rupture of the stomach. There may be free vomition and the peripheral coldness, cold perspiration, running down pulse rate, empty arteries, labored breathing, and tremors about the shoulders and flanks combine to bring about a clinical picture that all practitioners recognize as signs of approaching death.

Treatment.—The prevention of dilatations is found in the prompt relief of gastric colics by catheterization. It is also important to avoid a too sudden evacuation of colonic bloat when the stomach is overwhelmed. This is a fine point in the treatment of colics I would like to impress upon my audience. And lastly the stomach after having been relieved of its harmful

contents should be refilled with hot water. These recommendations are particularly essential in stomach colics of old horses and in those of some hours' duration.

Weak solutions of aromatic spirits of ammonia instilled into the stomach as a parting treatment is beneficial to the weakened circulation, strychnine subdermally is helpful and warm clothing, body frictions and sinapisms cannot be overdone.

Overloading of the Rumen

Acute bloat of ruminants is one of the commonest of strictly surgical diseases of animals. It occurs with great frequency in cattle and sheep in this country, and is due usually to the rapid ingestion of gas-forming feeds, such as green clover. The hazard of turning a hungry herd into a clover pasture is well known to all veterinarians and experienced stockmen, but green corn or any green exuberant pasture may cause it. Amongst city cows we find its cause is usually the ingestions of tainted feed, garbage, etc.

The disorder may run a rapid course and end fatally in a few hours or take a less acute course and last several days when the formation of gases is not so rapid. In the most acute forms bloated carcasses of animals are sometimes found in the pasture as the first evidence of trouble, and as a rule animals are dead or hopeless before a veterinarian can come to their relief.

Treatment.—In the acute form rumenotomy is the only practical procedure. The trocar and canula thrust into the left flank does not always effect a satisfactory evacuation of the gases because of the semi-solid character of the contents. A larger opening made with a scalpel, through and through without ceremony is justifiable when death from asphyxiation threatens. When the immediate danger is thus dispatched, then a more painstaking operation may be performed.

In the milder attacks where the gases are separated from the solid contents the trocar and canula afford relief promptly enough.

Impaction of the Rumen

Impaction of the rumen is also a very common disorder in which surgery plays the most important role. It occurs both as a primary and a secondary affection.

Treatment.—This form of stomach colic in its more formidable form yields only to surgical treatment. Medicants are often useless. It is cured either by rumenotomy or else by the *procedure of Imminger*, which consists of the instillation of water directly into the rumen through a canula and then aspirating out the softened contents by placing the animal on its left side with the canula still in place. The patient is placed on an elevated platform made of two planks separated from each other just far enough so that the protruding canula will pass between them. It reminds one of emptying a barrel through the bunghole. The liquid which runs out carries with it considerable of the solids and besides rids the rumen of harmful toxic products besides softening the mass better to facilitate its onward passage through the alimentary canal. The possibilities of this operation have never been tried out to any great extent in this country, but it seems to be destined to become a standard operation. The softening of the contents of impacted rumens by instilling water through a canula is not new, but the washing out process of Imminger is, I believe, an innovation.

EDITOR'S NOTE—Next month Dr. Merillatt will discuss foreign bodies in the stomach of dogs, foreign in the rumen impaction of the crop of fowls, ailments of the small intestine and of the large intestine of horses and methods of treatment which he has found useful. His discussion of colonic flushing in the horse and a new method of reposition in cases of torsion of the colon in horses cannot fail to interest those whose patients include horses.

Disinfectants and Their Standardization

By WATSON LEWIS, D. V. M., Saint Paul, Minn.
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AN ANTISEPTIC prevents the growth of germs, while a disinfectant kills them. It is hard to say just where antiseptic action leaves off and disinfectant begins, for they are so closely allied that the terms are commonly used synonymously. It is a well-known fact that a substance may cause a very marked inhibition of bacterial growth and still be of little value as a germ destroyer. For instance, turpentine will retard the growth of spores in solutions of 1 to 75000, while carbolic acid only retards in a solution stronger than 1 to 1250. This powerful antiseptic action explains the high efficiency of turpentine in flatulent conditions both in human medicine and in veterinary medicine.

Nothing is used more frequently in veterinary surgery than antiseptics and disinfectants, many of which are standardized. However, such is not the case with coal tar, and allied disinfectants, for here no standard has been adopted to protect the consumer against fraud.

These preparations are now offered on the market at prices varying from fifty cents to $5.00 per gallon. The $5.00 preparation may be actually cheaper than the fifty-cent preparation, because of its germicidal value. Accurate test shows that there are preparations fifteen to seventeen times more efficient than carbolic acid, but they do not sell for fifty cents per gallon.

The question now arises, "How are we to know the real value of a germicide?" In the last few years, both in this country and in Europe, there have been very rapid advancements made in the accurate standardization of disinfectants. It is time that the old statements in textbooks that bichloride of mercury kills anthrax in so many hours, and Streptococcus pyogenes in so many minutes should be discarded. It depends entirely on the strains of the organisms tested and the method used.

One strain of Streptococcus pyogenes may be killed in five minutes while another strain will require twice the time by the same method.

Carbolic acid and the salts of the heavy metals—silver, copper, mercury, etc.—have been mostly used as disinfectants. There is now a tendency to discard these for the more easily applied preparations. The general fault of which is their lack of efficiency in the presence of organic matter, i. e., blood and pus, etc.

Another group of disinfectants not used to any appreciable extent, but with high efficiency, is the essential oils. They owe their germicidal value to their phenol content, which, in some instances, is very high; i. e., Thymol, which is a phenol obtained from the oil of thyme, is twenty-five times more powerful than carbolic acid.[1] The expense and the inconvenience of application accounts for their limited use, which is unfortunate, because they are very slightly toxic, do not coagulate organic matter to any appreciable extent and are only slightly irritating.

The germicidal value of most of the commercial coal tar disinfectants is due to the cresole—para-cresol, meta-cresol and ortho-cresol—which are variable in their germicidal efficiency.

Para- and meta-cresol are much more germicidal than ortho-cresol, and the amount of each present may vary markedly in different lots. Therefore, it is necessary to determine the percentage of each, in each lot, by fractional distillation.

Several methods have been advanced for the testing of the germicidal value of disinfectants and lately much work has been done toward standardizing such methods.

The methods of the Lancet commission,[2] Rideal-Walker,[3] and that of Anderson and McClintic,[4] of the United States and Marine Hospital service have all been em-

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Intelligent Therapeutics*

By Dr. H. JENSEN, Kansas Cily, Missouri

THE use of medicinal agents for the relief of disease has been in vogue from the very earliest times; originating, like most other modern sciences, in superstition. It has, nevertheless, through the centuries of the past, developed from a state of mysticism and superstition into a definite, logical science. Notwithstanding this latter fact, there exists within the ranks of medical men, a great diversity of opinion with reference to the relative value of drugs and the method of their application, hence several schools of medicine have sprung into existence. It is not my purpose to discuss the relative merits of these schools, but I take it for granted that we are all agreed, that the sensible way to ascertain the merit of a drug is first to ascertain chemically its component parts, next the definite effect it exerts upon the organs and tissues of the body, the changes and modifications it undergoes within the body, and finally to secure an abundance of clinical evidence to verify the laboratory findings.

Modern medical therapeutics demands that the prescriber of medicines shall be in possession of these fundamental facts, in addition to a knowledge of the proper dosage to accomplish the desired end and the facts connected with the absorption and elimination, in order to regulate the amount to be given, as well as to determine how often medicine should be repeated.

It must be stated, however, that in some cases our knowledge of the action of medicinal agents is empirical, i. e., we do not know just how certain actions are brought about, but that our evidence of a drug's usefulness is wholly based on clinical observation. The Eclectic school of medicine, thus, does not inquire into the question of pharmacodynamics, but relies wholly upon clinical observation.

Among the present-day practitioners there are three classes of medical therapeutists. First, the class that I choose to call the *Intelligent Therapeutist*—one who knows the properties of the drugs he prescribes, their proper dosage, their action locally, as well as their action upon organs and tissues of the body after absorption; their channel of elimination, how they affect the organs during elimination.

The second class I have chosen to call the *Idolatrous Therapeutist* — one who ascribes to medicine some supernatural influence and who perhaps has been regaled from indifferent sources as to the marvelous cures effected by different drugs. He is always on the lookout for new receipts and formulas, but never has taken the time to inquire into how their action is brought about—hence is groping in the dark.

The third class I have chosen to call the *Therapeutic Nihilist*—one who openly and frankly declares his absolute lack of faith in drugs, and yet you will find that the members of this class carry, in their medicine cases, a goodly supply of medicinal agents, usually very poorly selected. The status of the two latter classes I ascribe to nothing else than simply a very imperfect and superficial knowledge of medicinal agents. My reasons for these statements are as follows:

Most of our medicinal agents contain certain chemical substances of which the alkaloids and glucocides are the most important. These chemical agents, like all other chemical substances, have a certain affinity or unite more readily with certain tissues or cells. As a result of this preference, the term "selective action" has come into use, and means simply the specific action that a drug has on certain cells or tissues in preference to others. That this action is chemical in its character, is no longer doubted, and that, as a result of this attraction of the drug for certain centers, a certain effect is produced on the various centers governing body functions.

Thus we know that drugs stimulating the vagus nerve roots originating in the medulla center and its fibers terminating in the heart, slows the heart and lessens blood

*Read at a meeting of the Missouri Valley Veterinary Association, Omaha, 1912.

pressure. We also know that depression of the vagus nerve gives the accelerator freer play and the result is quickening and strengthening of the heart.

Blood pressure is regulated as well by the vasomotors as by the heart beating more rapidly and forcibly. Thus it may be taken for granted, that vaso-dilators lower blood pressure by increasing the caliber of the blood vessels and that the vaso-constrictors increase blood pressure by diminishing the caliber of the blood vessels, through lessening or increasing the resistance to the flow of the blood stream. We can with drugs stimulate or depress the brain, produce a state of wakefulness or bring about a state of drowsiness and allay pain, or, by the means of anesthetics, overcome all sensation.

With drugs we can dilate or contract the pupil, allay spasms, increase or diminish secretions, remove the bowel contents, increase, diminish or modify urinary secretions, influence metabolism, etc., etc. Yet some men dispute the value of drugs, but let me state that the trouble is not with the drugs, but with the men who administer them without knowing their action.

With this information as to their action in hand it is certain that we can select drugs which will assist nature in overcoming many of the ailments to which the lower animals are susceptible, but we must first diagnose our cases correctly, and next we must know just what our medicinal agents will do and how they do it. In practice we meet, as every honest man must acknowledge, a number of cases that we are unable to diagnose; such cases must be treated symptomatically, by observing character of pulse, respiration, etc.

Therefore, if we will take the time to look into how these actions are brought about and the effect of this influence upon the organs and tissues of the body, there is absolutely no reason why therapeutic idolatry or nihilism should exist. The science of pharmacodynamics, or the physical action of drugs, has through the labors of such eminent men as Schmidlberg, Binz, Cushny, and many others, given us an absolute and definite knowledge of the effects of drugs upon the body under the various conditions and a knowledge of these facts together with a knowledge of the patients' conditions, should enable us to obtain the results desired. That fatalities occur after the administration of medicinal agents even though intelligently selected and administered is true; such untoward results may be due to idiosyncrasy or some condition of the patient overlooked by the doctor, but these occurrences are rare.

The reason for so much controversy on this question I can ascribe to nothing else than the fact that in the past students of medicine have simply been overloaded in the classroom with a lot of glowing tales of the awe-inspiring results obtained from certain combinations of drugs in certain diseases. The question of how and why has not been discussed and for this reason the student has never been able to reason for himself and simply does not know how. At a veterinary meeting not long since a gentleman recommended a combination of fluid extract of gelsemium and cannabis indica applied to the forehead to allay the cerebral excitement in cattle suffering from corn-stalk disease—a case of idolatrous therapeutics. A good friend of mine condemned in hard terms the use of hydrogen peroxide, as it had ruined a horse's foot; evidently my friend was not aware of the proper use of this agent—a case of unintelligent therapeutics. I want to assure my auditors that these remarks are made only in the spirit of helpful criticism, with the purpose in view of overcoming an unwarranted prejudice against medicinal agents.

In order to increase the practical value of this paper, I have prepared a number of "Don'ts" for our guidance, that should be of value in every-day practice.

1. Don't give aconite, acetanilid or their synergists when the blood pressure is low.

2. Don't depend upon adrenalin alone as a heart stimulant, except in collapse and chloroform narcosis, because of its very transient action; nor use it as a hemostatic in cerebral and pulmonary hemorrhages, for it is worse than useless in such cases.

3. Don't use aloes as a purgative unless you can wait twenty-four to thirty-six hours for results, nor give it to pregnant mares, or where there is a tendency towards intestinal inflammation.

(Continued on page 57)

A Farm Water Supply Injurious to Horses

By WARD GILTNER and E. T. HALLMAN, East Lansing, Michigan

Laboratory of Bacteriology and Hygiene, Michigan State Agricultural Station

THE literature on the pathological effects of drinking water on either man or the domesticated animals is not abundant in so far as definite conclusive results are concerned relative to its inorganic dissolved substances. We have not been able to find anything definite in the literature relative to the evil effects of the dissolved inorganic substances in the water supply of the domesticated animals.

Parkes says:

Dyspepsia and Diarrhea.—Waters with permanent hardness exceeding 8° or 9° sometimes cause dyspeptic symptoms and diarrhea, especially amongst those who are not used to them. Similar symptoms are generally produced by drinking brackish water drawn from wells near the sea coast. The injurious salts are especially the sulphates of magnesium, calcium and sodium, and the chloride of magnesium. Particles of suspended clay, mica, or vegetable matter may also cause diarrhea.

The view formerly held that urinary calculi arise from the use of hard water is generally abandoned from the want of definite proof. There are no facts to support the view that rickets results from the use of soft water. It is possible that drinking water in some way or other is a factor in the production of goitre, although further researches are necessary to elucidate this question.

It is remarkable to what extent the domesticated animals can drink natural waters of the greatest variety of sources without apparently suffering thereby. On the other hand, some of the unexplained mysterious outbreaks of disease among livestock might find their solution in an extended study of the water supply. No doubt during recent years the purely chemical aspects of water hygiene have been neglected owing to the over-emphasis that has been placed on the biological features.

In the annual report of the Bacteriologist of the Michigan Agricultural Experiment Station for the year 1910, one of us (W. G.) made the following brief report on a wasting disease of horses at Imlay City:

The laboratory received a letter from Mr. W— of Imlay City, March 28, 1910, describing a peculiar condition to which his horses were subject, under certain conditions.

A visit was made to the farm of Mr. W— near Imlay City, April 9, 1910, after a correspondence that had failed to offer an explanation for the trouble. The farm consisted of about 40 acres of level but well-drained, productive land. The system of farming was an intelligent rotation which, aided by a small herd of shorthorn cattle, maintained the fertility of the soil. The farm buildings were very sanitary and well constructed. The barn-yard was clean. Water was supplied in a wooden trough in the barn-yard from a well 17 feet deep, and about one rod outside the barn-yard. The drainage was found to be away from the well and the water was apparently very good. It was used for household purposes and for all the livestock.

The horses were fed the best of timothy hay and either oats of the best quality, or ground feed. According to the owner, he had kept all kinds of horses, both young and old, for seven years, but if he gave then all the feed and water they wanted, they would become weak, lose flesh, the legs would swell greatly, and it would be impossible to get a reasonable amount of work from them. They always showed a loose condition of the bowels and the food passed them only partially digested. The urine would be dark in color, and the odor in the stables became unbearable. None of these horses during the seven years had died of this trouble, for the owner had always disposed of them whenever they showed the symptoms described and it was his experience that under the changed ownership the horses invariably improved and soon assumed a normal condition. If, however, the horses were returned to the affected farm, the trouble would soon manifest itself again.

The horses were always in better condition when on pasture in the summer, although the same water was used, while a return to stable feed was invariably attended by a relapse. It was found that by restricting the amount of water allowed each horse to one pailful morning and night the trouble might be held in abeyance. The horses would not keep in the best condition even on this regimen, but if they were allowed water *ad libitum* for several days the trouble would return. It was not known that any similar cases ever occurred in the neighborhood.

An analysis had been made of the water without finding anything to condemn it. We do not know the nature of the analysis. Different veterinarians had prescribed symptomatic treatment with palliative but transient effects.

We were unable to discover any clue as a result of our visit. The owner appeared to be a careful and liberal stock feeder. Previous to the seven years of trouble, he maintained that he and his father had always kept horses on this same farm in the best of condition. Just before the trouble began, the old barn was replaced by the present structure and the water trough was first used at

that time. Another well had been dug, but the trouble continued.

It was advised that the stables be carefully disinfected, and that the wooden trough be replaced by a new galvanized iron tank. This was done, but a letter received June 1st, 1910, reported no change in the condition of the horses.

A sample of the water taken from the trough showed only a few bacteria per Cc., one of which, a yellow staphylococcus, was not pathogenic for guinea pigs.

Nothing more was heard of this case until the summer of 1913, when a letter from Mr. W— indicated that the trouble still existed. It was decided to make a more thorough investigation at this time, and one of us (E. T. H.) made another visit to this farm. As a result of this visit, it was observed that these horses possessed a ravenous appetite, would consume the bedding placed in their stalls, and showed a persistent looseness of bowels. A note on the result of this visit may be found in the report of the Bacteriologist of the Michigan Agricultural Experiment Station for the year 1913. From this report, we quote:

The evidence at hand points to the water as the most probable cause of the trouble, since a change of water will give relief. Strange to say, water from the same well is used by the family (also for cattle) without injurious effects. Evidently the water contains an excess of some salt or salts, the effects of which are more pronounced on the horse than man.

A bacteriological examination of the water collected at the time of this visit showed the presence of no bacteria that could be incriminated in connection with the trouble under discussion.

Since suspicion rested upon the soluble inorganic constituents of the water, it was decided to make a complete chemical examination, not only of the water from the affected farm but of that from an adjoining farm where the conditions described have never existed. Consequently, suitable samples were collected and sent to the laboratory for the analysis. For the analytical work we were fortunate in securing the services of A. Itano and W. C. Marti, assistants in Bacteriology and Chemistry, respectively, at the Michigan Agricultural Experiment Station.

We quote from their report as follows:

The following tables give a comparison of the two waters in question. By combining the various groups of elements of Table I to form so-called "hypothetical combinations" (Table II) some idea of the possible physiological or therapeutical action of this water can be obtained.

TABLE I.

	A.	B.
Turbidity	slight	none
Color	slight	slight
Odor	faint	none
Residue on evaporation	118.50	56.40 parts per 100,000
Oxygen consumed (parts per 100,000)	0.9164	0.5375
	A.	B.
SiO_2	2.12	1.93
$Fe_2O_3VAL_2O_3$	0.17	0.17
CaO	16.03	9.03
MgO	15.32	9.54
K_2O	trace	trace
Na_2O	16.61	5.51
SO_3	32.65	2.95
CO_2	22.00	21.12
Cl	1.40	0.60
N as Nitrates	0.22	0.06
N as Nitrites	0.0025	0.0005
Ammonia	0.0005	

TABLE II.

	Parts per 100,000		Grains per gallon	
	A.	B.	A.	B.
SiO_2	2.12	1.93	1.272	1.158
Fe_2O_3 Al_2O_3	0.17	0.17	0.102	0.102
$CaCO_3$	28.63	16.13	17.178	9.678
$MgCO_3$	18.01	19.95	10.806	11.970
$MgSO_4$	20.13	....	12.078	.....
$NaHCO_3$	.....	6.89	.....	4.134
Na_2SO_4	34.13	5.24	20.478	3.144
NaCl	2.31	1.00	1.386	0.600
$NaNO_3$	1.33	0.37	0.798	0.222
	106.83	51.68	64.098	31.008

Discussion of results:

Of sample A: The total solids are exceptionally high; 50 parts in 100,000 of total solids is the usual allowable limit for such water.

The nitrites are high, the usual allowable limit being .0005 parts per 100,000.

As will be seen from Table II, Na_2SO_4 and $MgSO_4$ constitute over 50 percent of the total solids. The "loose condition of the bowels" can in all probability be attributed to their presence.

The oxygen consumed is above the allowable limit of 0.2 parts per 100,000.

Of sample B: The only bad feature in this water is in the oxygen consumed, but since this determination is not conclusive, not much weight must be placed on it.

It will be seen from these analyses that there is a great excess in the amount of total solids of the water from the affected farm. If we accept the hypothetical combinations of the chemists, then this excess consists in calcium carbonate, magnesium sulphate, sodium sulphate, sodium chloride and sodium nitrate. The excess of salts involves those agents which are known to have laxative properties and one which is known to have marked diuretic properties. We have estimated that a horse weighing 1500 pounds (such as the affected horses) would drink fifteen gallons of water *per diem* while at hard work in the summer. In this quantity of the water in question, a horse would be getting 1 1-16

(*Continued on page 58*)

Do We Make Good Use of Our Knowledge of Dietetics?

By W. H. DALRYMPLE, M. R. C. V. S., Baton Rouge, La.

SO MANY excellent articles, on all kinds of subjects, seem to appear so frequently nowadays in our veterinary journals, that when one is asked for "something," it is extremely difficult to decide upon what to write about that has not already received attention.

This seems to be the writer's predicament at the present moment.

However, as the genial editor of VETERINARY MEDICINE has made the request for a few lines on "something," we presume we will have to accede. In fact, we feel it is about as difficult a matter to refuse as to decide upon an acceptable topic. What, then, shall it be?

We believe it is generally admitted, with reference to human beings at least, and we think we might include the lower animals under domestication, that the greater number of ailments, or the greater number of cases of ailment, are produced through the influence of food and water. Or, we might say, dietetic errors.

If this be admitted, as applying to our patients, might we not ask the question: Are we, as a profession, sufficiently conversant with the subject of veterinary dietetics?

Of course this belongs to the sphere of hygiene, which means, in the main, the preservation of health; and in the minds of some, the preservation of the health of animals might be considered to militate against the financial success of the practitioner. This was the view held by the older practitioner of human medicine when hygiene first became a science. But is the same opinion held today? We think not; and there are just as many large practices among M. D.'s as ever there were. In fact the doctor of human medicine who is not familiar with the laws of hygiene, and fails to put them into practice, is now considered a "back number," and is more likely to lose his clients than if he ignored them altogether. And we believe the time is coming, if not already here, when the veterinary hygienist will be held in greater esteem by his client than if he "blundered along" in the old way, without ever a word of advice as to how best conserve the health and working condition of his animals.

It is not our intention to write a treatise on veterinary hygiene, even if we were competent to do so. However, that branch which deals with dietetics, or, in short, feeding, is of such every-day importance, from an economic point of view, that a few straggling thoughts along that line may be of somewhat general interest.

What to feed, and how to feed it, in order to obtain the most satisfactory results at the least possible cost, has been, and always will be, one of the chief economic problems confronting the feeder of livestock.

What is food? In the broad sense of the term, it is the material which, when taken into the body, builds up the tissues and yields energy. The very act of living brings into activity all of the vital processes, which, in reality, means work. Every movement of every organ of the body; the very act of breathing; every contraction of the heart in forcing the vital fluid through the arterial and other channels; the tension brought upon the muscles in the act of standing; the contraction and relaxation of those muscles in progression; the effort produced in the process of mastication, and of digestion in general, and so forth, all call for work of varied degrees of intensity, and which has to be conserved, built up, or replaced from the outside by means of suitable nutrients contained in the different raw materials we call food.

Food, then, is as absolutely essential to the life, development, and energy of the animal machine as fuel of a different kind is to the movement of the steam engine.

It is converted into heat and energy in the former much as is fuel in the latter, viz., by a process of oxidation.

In order to maintain a healthy or normal equilibrium, however, food must be regularly supplied the animal so as to replace the tissues that are constantly being wasted, and the energy that is constantly being expended, as the result of work.

The foregoing may savor slightly of the "kindergarten," and ought to be familiar to everyone who may take the trouble, or has the patience, to peruse this article. Still, if it should have the effect of refreshing the memory of even a single reader, it will not have been lost.

In order to economize space, we are going to take it for granted that all of our readers are familiar with the various nutrients contained in feeding materials, and the part each plays, in digestible form, in the animal economy; also the meaning of the terms, feeding-standards, balanced-rations, nutritive-ratios, etc. But there is one phase of the subject to which I would like to draw more special attention, viz., *system* in feeding. For, it is possible that a feeder may have all the necessary information concerning the things just mentioned, and yet he cannot possibly secure the maximum of good results unless he employs a rational and intelligent system in the feeding of his animals. In fact, an animal's food may be properly balanced as to its digestible nutrients; it may be correct as to quantity and nutritive ratio; in short, be perfect in every particular, so far as supplying the needs of the animal is concerned, and yet, if an intelligent system is not employed in the feeding of it, the otherwise perfect requirements may be altogether vitiated.

Let us take the following illustration: A properly-balanced ration of the best quality of oats, when rationally and systematically fed, may not induce a case of ingestion during the natural lifetime of the animal. But if the entire day's ration of oats is fed at one time—as we have seen it done—instead of being divided into three, or more, parts, it is liable, necessarily, to so derange the digestive apparatus as to set up conditions that will result in fatal consequences. Are we to blame the oats in such a case, or the unintelligent manner in which they were fed to the animal? And so it is with other kinds and classes of concentrated feeds; they require system in their administration to prevent indigestion, with its sequelæ, and to produce the best results in the capacity of the animal for work—in the case of a so-called work animal.

Animals under domestication, such as the livestock of the farm with which we have to do, and more particularly the work stock, are living under more or less artificial conditions with respect to their feeding, and are solely at the mercy of the good judgment, or otherwise, of the owner, or hired man, for the manner in which their feed is supplied them. With our knowledge of the physiological requirements of animals in this regard, we as veterinarians ought to be especially helpful to our clients, if only by way of suggestion along rational lines.

Errors are also made, however, in the feeding of roughages as well as concentrates, chiefly through ignorance of their chemical composition and their available digestive nutrients, and often in the case of leguminous roughages, or hays, as compared to those of a carbonaceous character.

With some feeders, hay simply means just hay, without any discrimination, whatever, as to its composition, which has led, in some cases, to adverse criticism of some of our most valuable varieties of leguminous hay. For example, a feeder of horses may have been accustomed to the use of timothy, or other grass hay, and he decides to make a change to alfalfa, or it may be some other leguminous hay rich in protein. But in so doing, he uses just as much of the latter as he did of the former, in connection with a similar amount of the same grain (concentrates). Soon he begins to complain, however, of his animals perspiring too much, and their kidneys acting too freely, and he places the sole blame on the alfalfa. In a measure, only, is he correct, but why? Timothy hay contains only about 2.8 percent of digestible protein; while alfalfa contains about 10.6 percent.

Given, therefore, the same weight of alfalfa as of timothy, there is not only a waste of protein, above that required by the animal, but the excessive amount in the system of this highly-nitrogenous principle is liable to act deleteriously on the kidneys, or break up into the elements of fat and produce heat and profuse sweating. The blame, therefore, rests, not so much with the hay, as with the irrational and injudicious manner in which it is fed.

A little further illustration of this point:

The approximate requirement, in dry matter and digestible nutrients, in the feed of a work horse weighing 1000 pounds, and per day, is as follows:

	Digestible	
Dry Matter Lbs.	Protein Lbs.	Total Carbohydrates Lbs.
23.0	2.3	14.3

If shelled corn and timothy should be the ingredients of the ration, and in order to approximate the protein requirement alone, using 15 pounds of corn, the following amounts would have to be fed:

		Digestible	
	Dry Matter	Protein	Carbohydrates
Lbs.	Lbs.	Lbs.	Lbs.
15 corn.....	13.35	1.18	11.46
36 timothy hay.	31.32	1.01	16.87
	44.67	2.19	28.33

By referring to the standard, it will be seen that this is not only an unbalanced ration, with an excessive waste of one of the nutrients, but more in quantity than a work horse could consume in a day with any sort of comfort. And yet, if it did not consume all of it, it would not receive the required amount of digestible protein.

On the other hand, the same amount of corn with alfalfa hay may be made to approximate a typically-balanced ration, as the following table will show:

		Digestible	
	Dry Matter	Protein	Total Carbohydrates
Lbs.	Lbs.	Lbs.	Lbs.
15 corn.....	13.35	1.18	11.46
10 alfalfa hay..	9.20	1.10	4.23
	22.55	2.28	15.69
The standard.	23.00	2.30	14.30

Our point is, therefore, that if an animal receives as large an amount of such a rich leguminous hay as alfalfa as is given to him in the form of a grass hay (when that amount is considerable), there is going to be trouble, and there is a logical reason for it.

We do not mean it to be inferred that a feeder is likely to give 36 pounds of timothy hay to his work horse in addition to his grain. And yet, if he does not, the animal is not getting the amount of protein required for its needs under the conditions of work mentioned.

However, this is a fair illustration of how a ration composed of certain classes of feeding materials may be so unbalanced as to deprive an animal of a part of one of the most important nutrients (protein), and cause an excessive waste of others. While, by substituting a more highly-nitrogenous hay, like one of the legumes, a balance may not only be secured, but much less of it needed to secure the balance.

The inference to be drawn from this, is, therefore, that it is neither necessary nor wise to feed as much of the rich leguminous hays as of the grass hays (which are much less rich in the protein element) with the same amount of grain of the same character. In other words, a concentrate and a roughage of the same class of feeds, whether both nitrogenous or both carbonaceous, usually upset the balance of a ration. But when one class is used as a complement of the other, whether it be the concentrate or the roughage, the proper balance is generally obtained, provided the necessary amounts of each are used. Corn and timothy hay are both of the carbonaceous class of feed stuffs; corn and alfalfa, or the clovers generally, represent both classes, the latter being highly nitrogenous.

Parenthetically it may be mentioned that while the method of computing rations from the percentage of digestible nutrients in the feeding materials has served a very useful purpose for many years, it would seem that a newer method is likely to take its place before so very long. In this, feed values will be estimated from their energy values in terms of "Therms," a therm being equal to the value of 1000 calories or heat units.

Ordinarily, such problems as we have

alluded to, are referred by the farmer to the animal husbandry departments of our agricultural colleges and experiment stations. This may be more or less excusable, perhaps, when it comes to the question of the economic feeding of our meat-producing animals on the farm; but would it not tend to impress the veterinarian's country clientele more with his importance and value to them, were he in the position to intelligently discuss with them the rational and economic feeding of their horses and other work stock? We are supposed to be informed on the subject; it is in the college curricula. Are we all making the best use of the information in practice?

What the Example of the Canadian Army Veterinary Service Can Teach Us

By GARRISON STEELE, M. D., D. V. M.

WHY do we, in our plans to secure legislation for the betterment of the United States army veterinary service, need an example, and why is the Canadian Army Veterinary Service an example to us, may be asked?

Human beings are all imitators. Indeed, imitation of the right sort is eminently respectable and advantageous for improvement amongst ourselves, as well as amongst the slaves of fashion. Each one of us influences the other in some degree. As I once heard Professor Henry Drummond, the Scotch geologist, say, "Each one of us carries marks of the souls of others upon him." And when we are gone, to use the fine phrase of Tennyson,

> "Our echoes roll from soul to soul
> And grow for ever and for ever."

Consequently, in all the work of life, we should recognize the influences surging upon us from all sides, and, in our plans for professional improvement, should be large-minded enough to see means for improvement and to seize them for our own upbuilding. Imitation is the sincerest flattery; and if we see anything in veterinary organizations of other countries that we can imitate, we flatter those countries when we adopt them. We, in America, have a keen sense of the defects in our army veterinary service, and it is natural that we should cast about to see what other countries are doing for the betterment of veterinarians in their armies. This method has been employed in the development of our army. There is no doubt that the history of the American army shows that it has, with the object of upbuilding, been a sincere admirer and a large imitator of European armies, especially that of England. Though of course these things would not be admitted for the world; because we are such an original people, and in suggestions of this sort the fact that, in our plans for reform, we are drawing and must draw liberally from methods of proven worth used in other countries, must be held back from public view.

When speaking of the United States army we should remember that it consists of numerous organizations within a large organization, the whole army being called the military establishment. Always, in the legislation which has made for improvement, the object has been the preparation of all organized units for those emergencies such as the Civil War, the Spanish War or a prospective war with Mexico, when it becomes necessary to organize big field armies; the object has been to be ready for immediate expansion of the subsidiary organizations for the big work to be done in the war or in case of war.

For these reasons the United States army has always been the greatest of imitators. Though the source of military ideas has to be kept under cover because America does not wish to becom a military power and is not today one of the military powers of the world. It is one of the inconsistencies of American life that we boast that our navy is the third largest and the third strongest in the world; but

that our army, though efficient as far as it goes, is insignificant in numbers. In veterinary organization in the United States army, therefore, we cannot ever expect to match Europe for large military veterinary organizations. Yet we are bound to cull the best ideas in army veterinary organization wherever we can find them and adapt them for our American use, that is, "Americanize" them, as it is called.

Truly we are a peace-loving people and are averse to agrarian spoilation of our neighbors—so are the Canadians. We may, therefore, profitably compare what they have done in army veterinary matters with what we have failed to do. And there are special advantages in comparing the Canadian army veterinary organization with our own army veterinary disorganization. The object for which our regular, standing army was established, national protection, national defense, is there made the duty of the militia. Theirs is a vast domain to be protected, though the number of people is small when compared with ours —at most fifteen millions compared with our ninety millions. The natural development is comparatively backward when it is judged along side of our own. Yet the high intelligence of the people is shown in their preparedness for the defense of the Dominion of Canada in time of danger. As a permanent unit of the Canadian army, the Canadian army veterinary service has been devised and is carried out as an organization to conserve the health of horses now in use in the country in the cavalry and artillery regiments, and to be prepared to care for large quantities of horses in case of war. Canada is not separated from Great Britain. It is itself a colony and has no colony of its own nor dependencies, as we have, beyond the seas. Yet this doughty people, this people most loyal to the British Crown, has instituted a system of colonial defence which inspires our admiration—and not the least part of it is the Canadian Army Veterinary Corps.

The Canadian Army Veterinary Service is certainly an example to us: first, in its organization; provision for personnel and administration; second, in the work stipulated for it; third, in part at least, in its regulations for appointment of veterinary officers and for their promotion.

The Service, as a part of the Canadian Militia, consists of three branches: (a) The Canadian *Permanent* Army Veterinary Corps; (b) the Canadian Army Veterinary Corps; (c) the Regimental Veterinary Service. The first consists of veterinary officers gazetted to the corps and of non-commissioned officers and privates, the officers being listed according to seniority. In the second are similar officers and men designated for duty with the mounted corps of the active militia *for four years.* The third consists of veterinary officers attached to regimental staffs. Amongst this body of veterinary officers, though there are belonging to the Permanent Army Veterinary Corps only two lieutenant-colonels, one captain, two lieutenants and four sergeants of different grades, there are, in the Canadian Army Veterinary Corps, a body of commissioned veterinary officers and non-commissioned men as follows:

CANADIAN ARMY VETERINARY CORPS

RANKS	PERSONNEL
Lieutenant-colonels	6
Majors	12
Captains	24
Lieutenants	58
Total officers	100
Staff-sergeants	5
Sergeants	30
Total staff-sergeants and sergeants	35
Corporals	40
Privates	75
Total rank and file	115
Total	250

The senior officer of the veterinary corps is its chief veterinarian, or officer administering as they call him, and he recommends appointments and promotions and is charged with the supervision of veterinary duties, supplies, statistics and estimates for necessities. The chief veterinarian of an independent militia district is called Principal Veterinary Officer of it, and his duty is to command veterinary officers and men of his district. The head, or administering veterinary officer of the whole corps,

of course is responsible for supervision of all army veterinary work and the making of all appointments to his corps, and special work such as the army veterinary school and the remount establishments.

In giving the outlines of the work of the Canadian Army Veterinary Corps one should mention first the responsibilities of the permanent veterinary officers. They are charged with the care of sick animals, the administration of veterinary hospitals, the reporting to general officers on animals, stables, camps, transports, forage, stable management, forges and shoeing and making recommendations looking to the health of animals. The duties of veterinary officers are numerous. They are accountable for the conduct of veterinary hospitals, the care of sick animals in them and their proper discharge. When movements of troops are to take place they are responsible for the lame or sick horses or for care in case of casualties, and must promptly treat, record and report to superiors cases occurring in such movements. They are to give attendance to private-owned officers' chargers. In case of infectious or contagious diseases their responsibilities are heavy, especially being mentioned their duties in outbreaks of glanders and epizootic lymphangitis. They are charged with disinfection, in all its completeness, and the sanitary disposal of carcasses. They are to teach and be taught in the army veterinary schools. They are in complete charge of veterinary medicines, instruments and surgical means and are responsible for their proper transfer, carriage and the care of veterinary stores. All official papers regarding all these matters are in their hands and they must make due report on all. They particularly have charge of shoeing and give courses of instruction in shoeing in camps for the purpose, and they supervise the casting of horses, in case of need, to prevent injuries.

The qualifications for positions such as these, as veterinary officers of the Canadian Army Veterinary Corps, are many, and the promotions not easy. The demands, under the Canadian regulations, are further evidence of the excellence of the organization.

We quote below from the official documents on this subject:

If a candidate's application is approved, he will be required to be certified by an officer of the P. A. M. C. as being physically fit.

THE EXAMINATION FOR APPOINTMENT

WRITTEN

	MAXIMUM MARKS
Veterinary medicine (2 hours).....	1,000
Veterinary surgery (2 hours).....	1,000
Veterinary hygiene (2 hours).....	1,000

(General papers referring to both horses and cattle, and embracing pathology in all its branches, surgical anatomy and general and special hygiene.)

To qualify—50 percent in each subject.

ORAL

Examination of horses—includes:

	MAXIMUM MARKS
Soundness generally and certificates thereon, ageing, shoeing, the eye, and detection of lameness.....	3,000
Clinical diagnosis, the practical handling of animals and administration of medicines.....	3,000

To qualify, 50 percent in each subject is necessary. An aggregate of 60 percent in all subjects combined will be required. A candidate will be rejected if he shows any deficiency in his general education.

PROMOTION

A lieutenant shall be eligible for promotion to the rank of captain on completing 5 years' commissioned service in the C. P. A. V. C., providing he has previously qualified in such manner as may be prescribed. A captain shall be eligible for promotion to the rank of major on completing ten years' commissioned service in the C. P. A. V. C., providing he has qualified in such manner as may be prescribed. Promotion to the rank of lieutenant-colonel shall be made by selection from majors of not less than twenty years' commissioned service in the C. P. A. V. C., who have previously qualified in such manner as may be prescribed.

EXAMINATIONS

LIEUTENANTS BEFORE PROMOTION TO CAPTAIN

This examination may take place any time after completing two years' service.

SUBJECTS

Duties of executive veterinary officers.
Military law.

CAPTAINS BEFORE PROMOTION TO MAJOR

This examination may take place any time within three years of becoming eligible for promotion.

The subjects of this examination, which are detailed in The King's Regulations and Orders for the Army, are as follows:

(1) Veterinary medicine.
(2) Veterinary surgery.
(3) Veterinary hygiene.
(4) Veterinary bacteriology and tropical diseases.
(5) One special subject selected by the candidate with approval of the Militia Council.

MAJORS BEFORE PROMOTION TO LIEUTENANT-COLONEL

The subjects of the examination, which are

detailed in The King's Regulations and Orders for the Army are as follows:

(1) Military law (Manual of Military Law, King's Regulations and Orders).

(2) Duties of administrative veterinary officers at home and abroad.

(3) Management of epizootics.

(4) Sanitation of camps, stables and transport from the veterinary point of view.

(5) Army veterinary organization in peace and war.

(6) The veterinary history of previous campaigns.

There is much that the existence and success of the Canadian Army Veterinary Corps can teach us.

Standing, as on a pinnacle, above all other facts, is the fact that the granting of commissions to veterinarians, like in the Canadian army, and the formation of the grades of veterinary lieutenant, veterinary captain and veterinary major, to say nothing about veterinarians in higher grades, has an inspiring influence individually and collectively on veterinarians in the service by prompting the individual to do his best work and by calling out talent, and by strengthening and solidifying the army veterinary organization. Colonel Piché* himself, the officer administering or chief veterinarian of the Canadian Army Veterinary Corps, is an illustration of the quickening of talent and stirring up of potentiality brought about by the granting of an army commission. In his earlier life *he spent nine years as veterinarian in the 1st United States cavalry.* We do not blame him if he left the American army in disgust and returned to his first love in Canada; for, at the time he served here, and it is now not much better, veterinarians had the grade of sergeants and the pittance of $75.00, or thereabouts, a month as pay. He had no outlook here then, nor seemingly would he have had much better prospects if he had remained, because he would still be without a commission and would be a non-entity like his brother army veterinarians are in the army of this proud Republic today. However, he withdrew from our army service, joined the Canadian army, and lives to be glad of the change. The contrast between his present exalted station, and of those who knew him here, is striking. His personality has been felt in the systematizing of the Canadian Army Veterinary Service and its touch was felt when he appeared before the Committee on Military Affairs of our House of Representatives in the 62nd Congress in the Hearing on our bill. The effect on the Committee was so availing that a summary of Colonel Piché's work was attached to the Committee's report favoring our bill. What Colonel Piché has done may be done by any commissioned army veterinarian in Canada. He has risen through the different grades to become Veterinary Director General; so may they. This can only aid the collective efficiency as well as the individual efficiency of his force.

Another point which comes home to us is the contrast between the conditions in the American army and those in the Canadian army in these respects. Individuality amongst veterinarians in the United States army, personal initiative, does not count. What boots it if there are a dozen men of Colonel Piché's calibre amongst the veterinarians in the American army, they cannot rise; they may as well bury their talent, because it cannot be productive. There is in our army no veterinary organization; no veterinary promotion. Our veterinarians are broken and dismembered. In our country there is for them no honor, no thanks.

If the Canadian army veterinarians rise through the different grades from veterinary lieutenant to veterinary colonel, the American army veterinarian should receive the grades of veterinary second lieutenant, veterinary first lieutenant and veterinary captain, as provided for in the Hay bill, H. R. 4541, now before Congress; because his responsibilities, if anything, are to be greater than those of the veterinarian in the Canadian army. For, consider for a moment the comparatively confined, but intensive, work of the Canadian Army Veterinary Corps, covering the government-owned horses of militia regiments and the private-owned horses of officers. Then consider the extensive work for the American army veterinarian. Should a veteri-

(*Continued on page 59*)

*It was our intention to intersperse halftones of Colonel Piché and other Canadian veterinary officers in this article. But we were unable to secure the photographs in time to permit it.—Ed.

Observations on the Clinical Diagnosis of Glanders*

By C. H. SCHULTZ, Veterinarian, Veterinary Research Laboratory, Alabang, Rizal

WITH the advancing knowledge of medicine, the subject of prophylaxis is steadily assuming a more important place, especially as related to infectious and epizootic diseases. Diseases that are transmissible from animals to the human family have, during the last three decades, received special attention. If we can reduce the number of animals affected, and reduce the number of carriers of germs destructive to animals and man, we reduce the mortality among our population and limit economic losses.

In no other class of diseases is it so necessary to establish, at the earliest possible moment, a correct positive diagnosis as in outbreaks of epizootic diseases.

Among this class of maladies, glanders has always been recognized as of the utmost importance, because it is fatal to man and because the economic losses to the community through death of horses are great.

In order to control an outbreak of glanders successfully, a positive identification of the disease affecting the living horse is necessary. At times easy, it is often very difficult to establish a diagnosis that will be supported by postmortem examination.

Many different methods have been advanced by numerous investigators, not one of which, however, amswers all phases or all conditions brought about by the contagion. Besides considering the history of the suspected animals and clinical appearance at the time, the veterinarian must be familiar with the different special methods that have, from time to time, been brought forward to detect obscure cases of glanders.

1. The consideration of the clinical symptoms, subjective and objective, as they present themselves upon a careful physical examination of the animal is most important and may decide the case. Since, whenever the clinical diagnosis is at fault, a serious loss to the owner results, it must be supported by other special methods. Therefore we have to consider:

2. The excision of an enlarged gland and its microscopic examination.

3. The cultivation on suitable media of the organisms causing glanders derived preferably from excised tissue.

4. The inoculation of susceptible animals.

5. Auto-inoculation.

6. The subcutaneous injection of mallein.

7. The cuti reaction, now discarded.

8. The agglutination method.

9. The precipitation reaction as improved by Konew.

10. The complement-fixation reaction.

11. Postmortem examination whenever possible.

12. The ophthalmo reaction, or, if we are more careful and correct in our expression, the conjunctival reaction.

It is scarcely necessary to dwell upon the drawbacks of these special diagnostic methods. Veterinarians are all familiar with the limitations of the mallein test, as an example.

Considering the sero-diagnostic methods, we must say that they can be carried out only in properly equipped laboratories. During the early stages of the disease, the complement-fixation test used by Mohler[1] often fails to give positive results. Whenever the animal has been infected ten days or more this test is, however, the very best method to detect glanders infection.

Among all these methods the busy clinician finds but one by which he can distinguish in a prompt and satisfactory manner animals that show obscure symptons, or differentiate other diseases with symptoms similar to glanders.

About 1907 Vallée attempted to diagnose glanders in horses by the introduction of mallein into the conjunctival fold of the

*Reprinted from the special Veterinary number of *The Philippine Agricultural Review*, August, 1913.

lower eyelid. He soon discarded the method as unreliable. Several investigators, however, were busy in devising methods suitable for clinical examinations.

Schürer[2] reported favorably on the conjunctival reaction as early as 1908, and its extensive use in the Austrian military service since then has demonstrated its value.

Fröhner[3] published a very complete report, covering observations upon 21 horses affected with glanders. The diagnosis of all these cases was verified by the introduction of two drops of a solution of five cgs. of dry mallein Foth dissolved in 4.5 cubic centimeters of 0.5 percent solution of carbolic acid. After twelve hours in positive cases a large quantity of purulent or muco-purulent discharge agglutinated the eyelids. Its production was continuous for twelve to thirty-six hours, more or less, in different cases. The discharge was pale yellow in color with a tendency to become viscid. The long hairs on the eyelids soon became matted together, especially near the inner canthus, and the discharge was often so profuse that it ran down over the cheek. The conjunctiva was markedly congested and sometimes the eyelids were swollen. The same amount of the same mallein solution applied into the lidsacs of healthy animals failed to produce any disturbance whatsoever. The reaction in these horses was typical, although the temperatures of the animals were high, between 38.5 and 39.5° C., which would prohibit the mallein test as usually applied. These 21 positive conjunctival reactions so carefully described by Fröhner were checked up with the complement-fixation tests and the postmortem reports, the results corresponding.

In 1911, Muller, Gächtgens and Aoki[4] published an interesting article on the relative value of sero-diagnostic methods and the conjunctival reaction as applied to glanders suspects among horses. From their observations they draw the conclusion that the introduction of a suitable mallein solution into the eye is the best and most practicable method to diagnose occult and doubtful cases of glanders.

In an exhaustive illustrated article Miesner[5] compares the results obtained with the complement-fixation test, the agglutination tests, and the conjunctival reaction.

All these tests were executed with great care, the results are published in comprehensive tables, and they are substantiated by careful postmortem reports.

One hundred and thirty-three glanders suspects were tested by the three different methods, and the results are compared and analyzed. As a diagnostic agent he used three cgs. of dry mallein Foth dissolved in three cubic centimeters of sterile normal salt solution. The solution was applied by means of a pipette or camel's-hair brush to the conjunctival fold of the lower eyelid. The reaction appeared in six to twelve hours and expressed itself in a pronounced discharge from the inner canthus which was mucopurulent, adhering to the lower lid, sometimes running down the cheek. In some cases a pronounced edematous swelling of both eyelids could be noted which produced a glassy appearance of the lids. Marked congestion of the conjunctiva and often complete agglutination of both lids were produced. After from fourteen to twenty-four hours the eyes began to clear up. Among 133 animals examined 59 glandered horses were diagnosed through the complement-fixation test, an accuracy of 100 percent. Fifty glandered horses were detected by the agglutination method, which number constituted 84 percent of the cases detected by the complement-fixation test. The conjunctival reaction detected 53 cases, or 90 percent, of those shown by the complement-fixation test. The complement-fixation test did not condemn any healthy animals. The agglutination test condemned 2 horses, or 2.7 percent of the healthy animals. The conjunctival test produced no reaction in sound horses.

The local application of a suitable mallein solution into the eye did not influence the sero-diagnostic methods.

From Java there is at hand a report of the work of Dr. L. de Bliek[6] director of the veterinary laboratory in Buitzenborg (Nederlandish India), who also indorses as simple and reliable the instillation of a

solution of crude mallein into the eye. The conditions prevailing in this tropical region are similar to the Philippines and the animals affected show similarity in conformation and uses. The report considers every phase of diagnostic methods, compares the results of the agglutination and the complement-fixation test, the subcutaneous injection of mallein, and the conjunctival test.

Results obtained with the last-named reaction were so satisfactory that De Bliek uses it in preference to older methods and hopes to eradicate the disease from the Island of Java by its systematic application.

Ten cases of strangles, four of saccharomyces, five of osteomalacia, and one of chronic catarrh of the sinuses did not react to the eye test.

Personal experience of the present writer, in four widely separated localities, has demonstrated the conjunctival reaction to be satisfactory and simple. During an investigation of an outbreak of contagious disease among native ponies at Calamba belonging to the Philippine Sugar Estates Development Company, its application gave negative results. *Streptococcus equi* was subsequently isolated from the afflicted animals, thus identifying the disease as strangles.

A glanders suspect was tested at the clinic of the College of Veterinary Science, University of the Philippines, and gave a positive reaction. The same animal was again tested at the veterinary research laboratory at Alabang. Its temperature was 39°C. before the subcutaneous injection of mallein and did not rise during the following forty-eight hours. The swelling around the point of injection was five by seven Cc., hot and painful, and remained until the animal was destroyed. The application of three drops of concentrated mallein into the left eye produced after twelve hours a profuse pus-like discharge, pale yellow in color, which adhered to the hairs and to the inner canthus of the eye. The conjunctival membranes appeared inflamed and swollen; the pus flakes would at times cover the entire cornea. The condition is well illustrated in Plate II. Postmortem examination showed changes characteristic of glanders in the lungs, liver, and on the nasal septum. *Bacterium mallei* was recovered from guinea pigs inoculated with pus from the submaxillary glands.

The same concentrated mallein was introduced into the eyes of five native ponies, selected at random, without, however, producing any changes. The mallein used in these tests was made from old cultures of *Bacterium mallei* at the veterinary research laboratory at Alabang.

In order to obtain a specific conjunctival reaction in animals affected with glanders, it is necessary that no irritating substances shall be present in the test fluid used, and that only a specific, intense mallein reaction be obtained. Five percent sterilized aqueous solution of carbolic acid or preferably sterile normal salt solution are the solvents used to make up a 1 percent solution of dry mallein Foth. It should be freshly prepared; two or three drops are applied to the conjunctive of the lower lid. This may be done with a pipette or with a camel's-hair brush. A small hypodermic syringe with a short blunt needle is quite suitable.

The changes considered indicative of a positive reaction appear in six to twelve hours and usually begin to recede after twenty-four hours. If the reaction proves uncertain, the application should be repeated in the same eye in the same manner twenty-four hours after the first instillation. According to Miesner, this will show no increase if negative, or a marked increase if positive.

The test cannot be repeated afterwards, since the membranes of the eye become accustomed to it and fail to react in a typical manner for some time. The other eye can then be used.

The ease of application, the ready manner with which the necessary materials can be obtained and carried, the simple interpretation of the results, visible to the veterinarian and owner alike, the rapidity with which a great number of animals can be passed upon, have at once recommended the conjunctival reaction to our profession. It produces a typical reaction even when

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Abdominal Wounds of Animals*

By J. V. Lacroix, Kansas City

UNDER this caption may be included a wide range of conditions wherein divers factors are to be reckoned with. In this brief treatise we shall consider the subject in a general way only, mentioning specific instances in the way of case reports, merely for emphasis.

Our domestic animals are all, because of the manner in which they are kept, subject to injuries of the abdomen. In a general way the horse and mule are more frequently affected than are the other animals. The fact that horses, used as they are in all kinds of service, exposed to various injuries in the way of runaway accidents, kicking one another when shod with calked shoes; together with the anatomical construction of the abdominal wall, accounts for their being frequently injured. The abdominal wall of the horse is more tense than is that of other animals, and being very agile and quite likely to struggle when ever any vulnerable object contacts the abdomen, they are often seriously injured. The ox, under the same conditions, would suffer little or no harm.

Cattle receive abdominal wounds rather infrequently. They are subjected to contusions probably more frequently than to any other mode of injury. Having thick skins and a rather loose and pliable abdominal wall, punctures and lacerations are of comparative infrequency.

Sheep have abdominal walls that are not tense and in addition the skin is protected by wool. Abdominal fat is usually quite abundant and sheep are not inclined to greatly resist confinement in any position, consequently they seldom suffer from injuries of the abdominal walls.

Swine are not frequently the victims of abdominal wounds; brood sows with large, pendant abdomens receive lacerations of the mammary glands occasionally, and various complications may ensue. This is the most frequent form of injury in these animals. Swine may wound one another in combat, or receive wounds from dogs or wolves, but this is not of frequent occurrence. Swine have more or less fat underlying the skin, and they may receive large and deep wounds without particularly making eventration imminent or necessarily a sequel, the result of a post traumatic necrosis of tissue.

Abdominal wounds are classified variously by different authorities. We shall for convenience here consider them under four different classifications, as follows:

(1) Contusions with subsurface solution of continuity.

(2) Lacerations without eventration.

(3) Wounds with eventration and without visceral perforation.

(4) Penetrant wounds with visceral perforation.

Contusions with Subsurface Solution of Continuity

Contusions with subsurface masceration of tissue occurs in horses and mules very frequently. This type of injury is occasioned by any heavy blow which is sufficiently forceful to separate any one of the several layers comprising the abdominal parietes. Contusions that are so directed as to displace relations of the various layers of the abdominal wall, by rupturing tissue, allow of considerable extravasation of blood and serum. Such injuries are accomplished by falls or kicks; by being crowded against door jambs or gate posts; by being bunted by cow's horns, etc.

Manifestation of such injuries may be evident within a few hours after they occur, or they may pass unnoticed until much subsurface extravasation or discharge of fluids has taken place. In some cases, only a small amount of blood escapes into the tissues, little swelling occurs at first, and not until infection has taken place is there marked inconvenience manifested by the subject. Abscesses occurring in this manner often contain large quantities of pus, and it is a noticeable fact that such

*Read at 50th annual meeting A. V. M. A.

conditions may persist for weeks at a time without perforation of the abdominal wall from necrosis.

To differentiate between abscess of the abdominal wall where there exists a large cavity filled with fluctuating detritus, and hernia, is not easy in certain cases. In vicious horses where the condition is painful, little is to be learned by palpation while the subject is standing. By casting such animals and placing them in a manner that the swelling is located uppermost, one can exclude hernia by absence of perforation of the underlying structures, and failure at reduction of the mass. Finally with an exploratory trocar or needle hernia can be excluded.

Where such abscesses involve one or more floating ribs, necrosis is more likely to result in perforation of the abdominal wall and being situated rather more near the superior part of the abdomen, swelling is not so extensive and it is more defined.

Treatment of such cases consists in evacuation of all pus and the removal of shreds of necrotic tissue. Such abscesses should be opened in a manner that perfect drainage may take place and little after care is necessary.

An extreme case of this kind was treated by the writer in 1906. The subject was a gelding weighing eleven-hundred pounds. He was very vicious and the owner had given him little or no attention. Not until the swelling had gradually become larger for about six weeks was any attention given the case. Location of the enlargement was in the left flank, and it extended from the umbilicus to near the anterior iliac tuberosity. The fluctuating center was about twelve inches in diameter. It was not possible to determine the exact nature of the condition without casting the animal. After properly confining the subject, diagnosis was not difficult. The abscess was drained of a large quantity of pus and the cavity irrigated with a weak antiseptic solution. The subject was allowed exercise, but it became necessary to enlarge the opening made for drainage in the course of about a week's time. The animal being hard to handle, no further treatment was given him, and complete recovery resulted in about a month.

Traumatisms resulting in hernia immediately with more or less subsurface laceration of tissue are met with quite frequently in all animals. Contusions produced by means of blunt objects often result in hernia because the skin is freely movable, and quite capable of withstanding injuries which do violence to the tissues underlying. Subcutaneous rents result in hernia where a sufficient opening in the abdominal wall is produced. Strangulation of intestine may occur and unless cared for, results fatally. Strangulation usually occurs where the injuries involve the region of the groin. Nonstrangulated herniæ are often found involving the floor of the abdomen anterior to the inguinal region.

No great difficulty is experienced in making a diagnosis of such cases, as they occur in connection with some injury and the skin usually bears some evidence of violence, even though it be left intact. By rectal examination those parts of the abdominal wall that are within reach may be palpated and the nature of the swelling determined. Where strangulated hernia exists, diagnosis is not so easily made as in cases of nonstrangulated hernia.

Treatment is imperative in cases of strangulated hernia and consists in confinement and anaesthetization of the subject. The skin over the swelling is shaved and cleansed with soap and water, dried and painted with tincture of iodine. A free incision is made, exposing the strangulated loop of intestine and the ragged edges of the subcutaneous wound. Reposition is effected by manipulation, after having drained a quantity of fluid with a small trocar. If little fluid is contained, it may be necessary to enlarge the opening slightly. After reducing the hernia approximation of the wound margins is effected by means of sutures.

In a case of strangulated hernia occurring in a twelve-hundred pound mule, the animal had kicked over a partition and become impaled upon an upright timber. In his struggles there had been torn and

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Transmission of Contagion by Immunization

By JAMES LAW, F. R. C. V. S., Ithaca, New York

THE writer has long been convinced that our favorite methods of fortifying the animal against attacks of pathogenic microbes, by the injection of enfeebled (mitigated, attenuated) microbes of the same kind, is, as a general sanitary resort, a stupendous blunder. He has naturally made no secret of his views on the matter, but, by word of mouth, and through the press, he has again and again drawn attention to the danger of the procedure. In his *Farmers' Veterinary Advertiser*, revised and republished in 1887, attention is drawn to the peril in (at one point seven consecutive pages, 57 to 64); and again in his *Veterinary Medicine*, Vol. IV, first edition, 1902, and third edition, 1912, the subject was pressed upon the reader, wherever the forgetfulness of it seemed to be proving a serious evil. For many years it seemed as if men's ears were stopped and the mind dulled to the gigantic evil, and that we must wait for a phenomenal disease-extension and unusual losses to secure public attention to a saner and in every way more beneficial alternative.

Happily there is at the present time some indications of a recovery of some logical minds from the mistaken glamor. In the *Breeders' Gazette*, Dec. 4, Dr. N. S. Mayo, in a short letter, names the *antihog-cholera* serum in connection with the "statistics showing the enormous losses." From the constant discussions in the public press he argues the aroused public interest. Ten days ago, in conversation with the president of one of our most advanced state colleges, where antihog-cholera serum is largely produced, I hinted at the coincidence of the unprecedented use of the immunizing agent in question, and the unparalleled extension of the malady. Three or four days later I received a letter from him, saying that the matter preyed on his mind, and asking for any information I could give him as to literature on the subject. As many others may be equally anxious to get some light on the subject, I may be permitted to repeat here some of the hints given to the president, and some quotations from my publications referred to above:

"I have been long impressed with the general evidence that the mad rush after immunization by injection of living (even if less virulent) germs is an enormous blunder, and that it has done not a little toward planting new centers of infection, and making extensions of contagious disease to points that would otherwise have remained free from the malady. It has been the means of furnishing a continuous succession of opportunities for the preservation, and perpetuation for all time, of definite infections and their diseases, which should have been extirpated and forever banished."

"Obsessed by the oft-quoted example of Jenner and cowpox, the medical profession has been blind to the fact that cowpox, in this age and continent at least, is essentially a distinct disease from smallpox, never gives rise to variola from vaccinations, and is never itself produced from a simple (uncomplicated) case of smallpox. From this narrow (and I must say unscientific) viewpoint, they have therefore gone *pell mell* into what they fondly hoped to be the work of abolishing, or at least greatly reducing, the mortality caused by a given microbe, by introducing that germ itself, in a slightly modified condition, into the system of a susceptible animal, and thereby passing that animal through a milder form of the disease."

"The daily work of the physician has, to his mind, justified his course in this matter, for he has his individual patient before him and his prominent thought is, his duty of saving this patient. The patient's family and friends have even more interest in the sufferer, and know less of the danger, so it cannot be hoped that they should look beyond, to consider the effect on the general public, and the perpetuation of the disease."

"The next consideration is that if the patient can be saved by immunization,

so can each member of his family, his friends and of the community in which he lives."

"As the physician goes on with the work he sees with pride, tens, hundreds, thousands, and it may be millions, passed through the apparently harmless disease (*immunized*) and nearly all saved from a future severe or deadly attack. Who would have the hardihood to question such a beneficent work? But however widely this good work has been accomplished, just so extensively (wide or narrow) live the *susceptible* community in which the weakened germ can find an ample field wherein to renew its ravages."

"If it could be shown that this weakened germ could never again become potent, virulent and deadly, the risk would be negligible, but from time immemorial we have had examples of plagues running in cycles, now mild and harmless, and now virulent and deadly, so that it is often largely a matter of environment which determines malignancy or benignancy. The introduction of the microbe into the run-down, weakened system is often an occasion of a change for the worse. In a very young or small animal a similar increase in potency is common, and, once exalted in potency, the tendency is to maintain this in new and less susceptible victims as well."

"Another condition to be dealt with is the *hypersensitiveness to a poison*, which is produced by an earlier dose, and which is liable to follow ten or fifteen days after the first introduction of the microbe."

"Once more the introduction of another microbe of a different species (as of bacillus acidi lactici to bacillus anthracis) will sometimes greatly increase the virulence and mortality."

"Still another consideration is the common experience of an individual that has passed through a plague and become immune from a new attack of the disease, but continues to harbor, carry around and distribute the germs to other susceptible subjects. Thus swine continue to carry the germs of hog-cholera, horses those of influenza, men those of typhoid fever, cows those of contagious abortion, etc., etc. There are plagues, recovery from which gives a reasonable guarantee of the death of the pathogenic germ, but there are altogether too many in which the survival of the germ, in or on the immunized animal, is well established, and there are still more in which its destruction is by no means proven, nor to be depended on."

"A resort of much older standing is the method of inoculating a pathogenic germ which acts mainly locally, or on a tissue which is very unfavorable to its extension. Long before the advent of bacteriology this had been practiced in lung-plague in cattle which was inoculated on the tip of the tail, and, at a loss of one or two percent at the most, a large herd was rendered safe. Still more ancient was the practice of inoculating smallpox, from mild cases in man, and sheep-pox from benignant cases in sheep. Mortality was almost nil, and the inoculated were saved. So in blackleg in calves, when inoculated on the tip of the tail, the loss was negligible and the other young cattle of the herd were saved."

"But no one of these resorts puts a final end to the plague in the farm, the district or the country. The germ was preserved, and frequently spread, and the plague continued, showing itself in the susceptible animals brought in from without, and in the susceptible progeny of the succeeding year or later. Hence Western Europe and Australia came to be the homes of lung-plague; Asia the perennial home, as it had been for Europe, the source, of smallpox; and the rich bottoms the habitat of blackleg."

"All such means of preservation of live-stock by the use of enfeebled germs have their spheres of usefulness, but they should be strictly confined to such areas. On a fenceless island, generally infected like Australia, in a secluded vally where there is no available access nor exit, on unfenced mountains or steppes with no stock near to suffer, or again in absolutely secluded premises, where the stock operated on can be confined, proven, and disinfected before they are set free, it is permissible, and may be the only visible means of salvage from valuable animals exposed. But the same cannot be said of current methods

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An Appeal Based Upon A Retrospect

THIS issue of THE AMERICAN JOURNAL OF VETERINARY MEDICINE marks the beginning of its ninth volume. A year ago in announcing the beginning of the volume closed with the issue of last month, the following statement was made, which, with the necessary chronological changes, is equally true now:

TO AVOID LOSS

No veterinarian can miss a single issue of VETERINARY MEDICINE without losing possibilities for treating disease more skillfully, serving his patients better, and as necessarily follows, enlarging his practice and increasing his income.

In America, veterinary publications are so few that no veterinarian can afford to be without any of them. Articles are rarely duplicated in these publications and to miss even a single number of any of them means that at least some valuable information is lost to the reader.

In VETERINARY MEDICINE almost nothing is repeated even in substance, from month to month or from year to year. Each issue as it reaches its readers is something new, different from all its predecessors and unlike those that are to follow. Each issue is a forward step in veterinary progress, an addition to the sum total of information on veterinary science.

THE AMERICAN JOURNAL OF VETERINARY MEDICINE has prospered greatly. It begins the eighth year of its existence with a subscription list three times as large as that of any other veterinary journal in the whole world, and an influence proportionately great. It is not the oldest publication by any means, but the veterinary profession by its endorsement and support has emphatically and unqualifiedly pronounced it the *best*, and I believe none will deny, even among those who are not its friends, if any such there be, that it *tries* hardest to serve the veterinary profession well, to the full extent of its opportunity.

It is to the policy of putting back into the journal all that it produces (and often more) that I attribute the splendid success of VETERINARY MEDICINE; every increase in the number of subscribers or increase in advertising patronage has been marked by an improvement in the quality of the journal or an increase in size or both. And the end is not yet; with this issue the amount of "reading matter" is increased nearly one-third, and is considerably more than two and one-half as much as was carried one year ago.

Subscribers may contribute much to the improvement of VETERINARY MEDICINE by renewing promptly upon the expiration of their subscriptions; and particularly is this true at this season of the year, when an unusually large number of renewals (several thousand) are due. Aside from the heavy financial draft a delay in receiving these renewals occasions, the time and energy required to send a notice of expiration to readers, whose subscriptions have expired (and in some cases a second reminder) takes just so much from the labor, which would otherwise be put upon the publication. The cost of preparing and mailing the notices likewise is not inconsiderable (at least a hundred dollars for each notice to the list of December expirations), and in turn detracts from the funds available for use on the journal. But the worst feature of the delayed renewal is the missing of one or two copies of the journal.

Very few subscribers with premeditation intend to discontinue their subscriptions to VETERINARY MEDICINE. Two dollars is a small amount to any reader, but in the aggregate its subscriptions are a matter of life or death to this or any other journal. Why not, then, treat your renewal as an important business transaction to be attended to *at once*.

Both you and the journal lose by delay; both gain by your promptness.

We had ample evidence throughout the year that the foregoing was widely read and carefully considered. The response to this appeal had much to do with such improvements as VETERINARY MEDICINE was able to show during 1913. May we count upon an equally wide response to its repetition and a corresponding advance and improvement for 1914?

Editing and publishing a successful veterinary journal in this country is not so simple a matter as many suppose. It is a task that in the past has claimed some of the best minds in the profession, and even so equipped, not all such enterprises have been a continued success, a fact which emphasizes the statements in the foregoing regarding the necessity for readers to cooperate with editors and publishers.

Elsewhere in this issue a short history of the publication of American veterinary text books is given, and a like record of American veterinary periodicals may be of interest to some of the newer members of the profession.

The *American Veterinary Review* was established in the late 70's by the U. S. Veterinary Medical Association, precursor of the A. V. M. A., but with the beginning of Volume V, in April, 1881, the publication and property of the *Review* was transferred to Professor A. Liautard of New York. During 1881, and for some years later, the *Review* was but a pamphlet in size, containing (including the advertising) from forty to fifty pages, yet the subscription price was $4.00 a year.

Ten years later (1891) the *Review* contained an average of sixty-four pages, exclusive of the advertising and the subscription price had been reduced to $3.00 where it has since remained. Another ten years brought an increase in size to eighty-seven pages of reading, and in 1911 it had increased to a magazine of more than 125 pages.

The *American Veterinary Review* has been issued by a considerable number of publishers. It was first published, as stated above, by the United States Veterinary Medical Association, and in turn by A. Liautard; Sabiston, Murray & Co.; A. Liautard and R. R. Bell; A. Liautard, R. R. Bell and R. W. Ellis, and, lastly, by the American Veterinary Review since September, 1906.

The *Review* has had a wonderful opportunity for service to the veterinary profession during an uninterrupted career of nearly forty years, and a file of its issues

(*Continued on insert page 1.*)

A DISCUSSION OF ANESTHESIA

The December issue of the *Annals of Surgery** is a special anesthesia number and should be in the hands of every veterinarian who does any surgical work, and that includes nine-tenths of the whole profession. This number of the *Annals* contains 266 pages, of which 122 pages (a book in itself) are devoted to papers on anesthesia by the highest authorities on the various phases of this subject.

The discussion includes papers on: "Accuracy in Anesthesia," "Reflexaction During General Surgical Anesthesia," "Deaths from Anesthesia," "Anesthesia in Goitre Operations," "Stovaine Spinal Anesthesia," and "Medicolegal Aspects of Anesthesia."

Aside from the discussion of anesthesia, veterinarians will find in this number and in every number of the *Annals of Surgery* a great deal of general information pertaining to surgery which they can utilize in their work.

SANITATION—SANE AND OTHERWISE

Throughout the meeting of the U. S. Live Stock Sanitary Association last month there was an insistence by many of the speakers, that in dealing with transmissable diseases we must revert to the use of well-known hygienic and sanitary measures which experience has shown to be valuable and depend less upon the immunizing effect of recognized biologic products.

This was particularly true of the discussion of hog cholera which occupied two sessions of the meeting. While the antihog-

*A monthly review of surgical science and practice, published by J. B. Lippincott Company, Philadelphia. Price 50c per copy, $5.00 per year.

cholera serum was more unanimously endorsed than at any previous meeting of the Association, there was a goodly number, among whom was J. W. Connaway of Missouri, one of the most experienced in the production and use of antihog-cholera serum, who insisted first, last and all the time (and without objection from others), that sanitation is of first importance in dealing with the hog cholera and that the serum and its use is a matter of secondary importance.

The article by Professor Law, published elsewhere in this issue, deals comprehensively with this same question and is most timely—a needed warning to many who seem to have forgotten or to have failed to grasp the basic principles of sanitation.

THE DIAGNOSIS OF PREGNANCY

The season is at hand when veterinarians will be called upon, frequently, to say whether or not certain animals are pregnant. In case of the prospective sale of a mare or cow it is often of the greatest importance to determine this matter definitely. Where animals are offered for sale at public auction; where they are moved from the county in which they are bred, and where the plans of the stock man for the coming season are in some degree dependent upon whether or not certain of his animals are pregnant, a correct answer to the question of pregnancy is of large importance. And later, during the breeding season and particularly where mares are sent away from home, often long distances, to be bred, it is many times desirable to ascertain whether or not conception has taken place from a particular service. Legal complications involving the question are not rare and veterinarians must often give expert testimony in this matter.

Nearly a year ago there was a brief mention, in these pages, of the Abderhalden test for pregnancy. Since that time it has been largely used for the diagnosis of pregnancy in the human and a great many tests of it have been made in animals with the result that it is accepted now as one of the most accurate of biologic reactions. The opportunities for its use in veterinary practice are many and veterinarians should avail themselves of its aid in diagnosing pregnancy in animals.

The test is simple, but requires a very careful and exact technic. It depends upon the presence, in the blood of the pregnant female, of ferments, which break up the foreign proteids, introduced into the blood from chorionic villi, into substances which are no longer toxic for the animal. The serum of the pregnant animal reacts to this test soon after the inception of a pregnancy (probably forty-eight hours in the bitch and four to six weeks in cows and mares) and continues throughout the period of gestation and for two or three weeks after parturition.

For the Abderhalden test, under aseptic conditions, draw 10 Cc. of blood into a sterile container, slant and set on ice for six or eight hours or longer; then decant the serum, which must be clear, without hemoglobin, and sterile, and send to a laboratory prepared for making this test. The test itself is not expensive and it requires only twenty-four hours to complete it.

DIETETICS IN PROPHYLAXIS

The trend of medicine, both general and veterinary, becomes with each succeeding year, more and more prophylactic. The introduction of numerous biologic products having the property of immunization has aided tremendously the work of preventing disease, and in the glamour of their use, we are apt to neglect hygienic measures for preventing and curing disease, which experience has shown to be of great value.

The contract veterinary work in large cities, and in railroad-grading, mining and lumber camps has impressed upon a few veterinarians the value of a scientifically computed regimen in preventing disease among horses; but many veterinarians are content to attempt to overcome with medicines or surgery, ailments that might be more easily prevented by an alteration of the diet.

The subject of feeding has been minimized in most veterinary colleges and neglected by most practicing veterinarians. The article by Dr. W. H. Dalrymple, published

elsewhere in this issue, aptly calls attention to the importance of proper feeding, to the health and thrift of animals; although somewhat elemental it is not more so than the circumstances require that it should be. The article will be much appreciated by nearly every veterinarian. Do not fail to read it with care.

SPECIAL COURSE FOR LICENSED VETERINARIANS

Beginning January 5, 1914, the University of Pennsylvania will conduct a course of lectures and laboratory instruction for licensed veterinarians.

The course will extend over two weeks and applicants for admissions from states, other than Pennsylvania, will be required to furnish proof that they are licensed to practice in the states from which they come. A registration fee of five dollars will be charged all taking the course.

THE RIGHT AND THE WRONG WAY TO CONDUCT AN ASSOCIATION

During the first week in December, two associations, having to do with livestock matters, met in Chicago. It is no news to our readers to say that on December 2nd, 3rd, and 4th, the seventeenth annual meeting of the United States Live Stock Sanitary Association was held in Chicago. Veterinarians everywhere and livestock men generally knew of this meeting before it was held and largely attended it, but perhaps less than half a dozen veterinarians and almost no one else knew that on December 3rd an annual meeting of the National Association of Boards of Stallion Registration was to be held, or until reading this have ever heard of the existence of such an association.

The meeting of the United States Live Stock Sanitary Association was widely advertised; it presented a program occupying three days and comprising highly scientific discussions on most of the widely spread contagious diseases of animals, on meat and milk inspection, the interstate transportation of animals, etc., etc. The meetings were public and had an average attendance of perhaps two hundred. Those present comprised the leading veterinarians of the United States and Canada, representatives of freight departments of several railroads and prominent livestock breeders and officials of state livestock commissions. The work it accomplished this year, will have an important bearing on legislation pertaining to livestock matters in most of the states and on the regulations of the United States Department of Agriculture.

The annual meeting of the National Association of Boards of Stallion Registration lasted only about two hours. It had no program, scientific or otherwise; its total accomplishment for the livestock industry was practically nil.

The opportunities before these two associations were practically equal. The one association is grasping its opportunities and accomplishing much; its meetings are public, and any one interested in livestock sanitary matters is eligible to membership. The other association, with vast possibilities before it, is failing to seize them at all, its sessions are chiefly secret, its membership is limited to officers of state boards, of stallion and jack registration, and out of the whole number only eleven state boards paid their dues during the past year. No scientific matters or matters of policy come up in its meetings, which are confined to the discussion of the various little tricks which stallion owners resort to to get unsound stallions registered as sound, or scrub and grade stallions registered as pure bred.

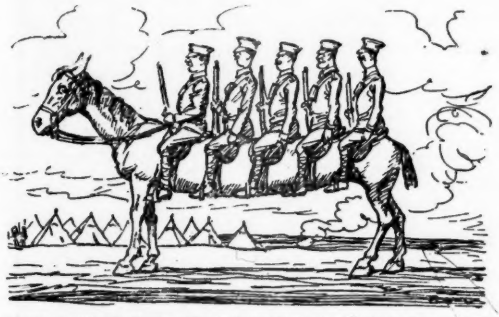
It would look as if men with scientific ability or political acumen enough to obtain positions on stallion registration boards would realize something of the possibilities that lay before an organization of this kind. Every stallion owner should be eligible to membership, and a scientific and practical program should be arranged and carried out that would bring them to its meetings in large numbers. If this association only half-way met its problems, its meetings would be attended by a representative from every agricultural paper of importance and by representatives of every official registering association. Since the certification of stallions as to soundness, if it amounts to

anything, must be done by veterinarians, veterinarians should, as a matter of course, be eligible to membership in such an association and have a part in its program.

An illustration of how to do it and how not to do it!

DACHSHUNDPFERDE

By playing up the shortage of army horses, present and prospective, and the possibility of establishing an American breed of light horses from the fast disappearing Morgan horse, the Secretary of Agriculture some years ago induced Congress to appropriate funds to permit the Department to engage quite extensively in horse-breeding in cooperation with the Colorado Agricultural Experiment Station and in various other states.



HOW TO OVERCOME THE DIFFICULTY OF THE SHORTAGE OF HORSES IN THE ARMY

The plan has all along been opposed and derided by leading breeders who point out the unwisdom of entailing the expense and loss of time necessary to develop a new breed, when established breeds, suitable in every way, are to be had from Europe; and also the futility of attempting to popularize a type that has been steadily losing ground for half a century, because of unfitness.

The breeders further assert that the apparent shortage of army horses is due chiefly to a "shortage" of price which the government is willing to pay for horses of a desirable type.

The accompanying suggestion from *Punch* is published for the benefit of the officials conducting this breeding enterprise. In view of the present unsatisfactory status of the Army Veterinary Service, and the possibility that there may be a "shortage" there; the suggestion is made, that before replacing the present army horse with this new type at the rate of five to one, the Department should ascertain if five veterinarians will be required to treat it, in the case of an attack of colic.

STATE SANITARY REQUIREMENTS GOVERNING ADMISSION OF LIVESTOCK

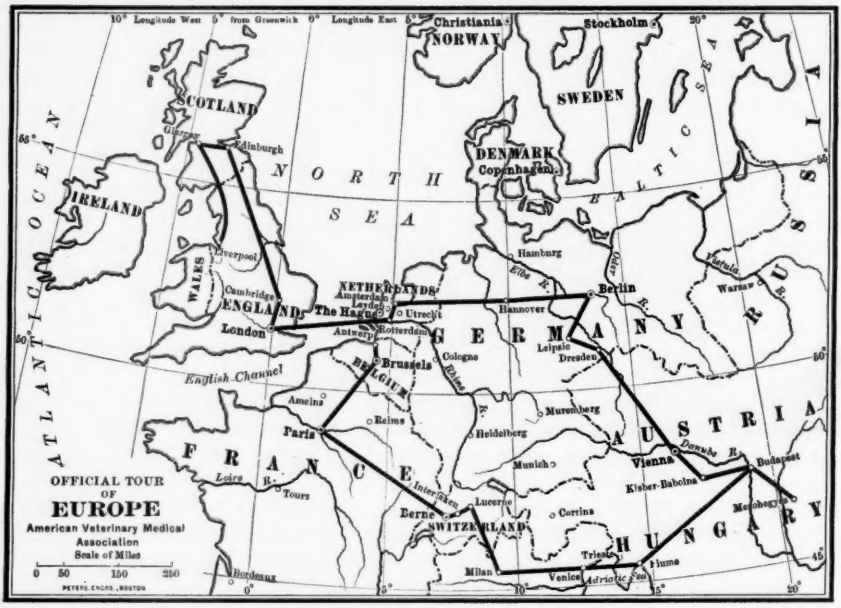
A revision has just appeared, of the pamphlet of this title, by the chief of the Bureau of Animal Industry. It gives the present requirements for the admission of livestock into each of the various states and is, of course, indispensable to veterinarians who do any inspection for interstate shipment.

THE BUREAU OF UNIVERSITY TRAVEL VETERINARY TOUR

The map on the following page outlines the course of the study tour for veterinarians, in connection with the attendance of the Tenth International Veterinary Congress in London. A study of the map is sufficient evidence of the careful planning of the tour, since the visit of all important centers of Europe are included where the best and most interesting veterinary institutes may be seen. Such a tour should be of the greatest advantage to veterinarians, affording them a splendid opportunity to broaden their knowledge. The sight-seeing part has also been given due consideration in the arrangements and especially so for the ladies of the party, who will be intrusted to the care of reliable guides while the men will visit the veterinary and other scientific agricultural establishments.

The United States Live Stock Sanitary Association at its annual meeting in Chicago December 2, 3, and 4, voted this tour an official one of that association and urged all members who find it at all possible to take this trip. The schedule for the tour is:

June 13	NEW YORK	Sail first cabin by steamer of the Red Star Line, $85 berth.
June 22	ANTWERP	Sight-seeing.
June 23	BRUSSELS	Veterinary College, and municipal abattoirs.
June 24	BRUSSELS	Experimental Station and Agricultural School of Gembloux, the largest and best in Belgium
June 25	PARIS	Visit to the famous Veterinary School at Alfort.
June 26	PARIS	Visit to the Pasteur Institute and laboratories.
June 27	PARIS	Abattoirs and stock yards of La Villette.
June 28	PARIS	Sunday spent in this metropolis will be full of interest.
June 29	VERSAILLES	Visit the great playground and palace of Louis XIV and the Petit Trianon of Marie Antoinette.
June 30	To BERN	Continuation of the trip through eastern France into Switzerland and evening at Bern.
July 1	BERN	Serum Institute of Bern. City sights.
July 2	INTERLAKEN	A day in the beautiful valley of the Jungfrau.
July 3	LUCERNE, RIGI	The finest of Swiss scenery.
July 4	ZURICH	Veterinary College, city abattoir.
July 5	ST. GOTHARD PASS	Most wonderful engineering feat in Europe.
July 6	MILAN	Veterinary College, abattoirs.
July 7	MILAN	City sights, including a visit to the beautiful Cathedral of Milan.
July 8, 9	VENICE	St. Mark's Cathedral and sight-seeing through the canals in gondolas.
July 10	FIUME	Enter Hungary by this port on the Adriatic.
July 11	MEZOHEGYES	One of the best government breeding farms of thoroughbred stock in the world.
July 12	BUDAPEST	City sights.
July 13	BUDAPEST	Municipal abattoirs' Veterinary College, Hog Cholera Serum Institute.



July 14	KISBER–BABOLNA	Highest type of Hungarian live stock.
July 15	VIENNA	Veterinary College, Hygienic Institute.
July 16	VIENNA	City sights.
July 17	VIENNA	Abattoirs and stock yards.
July 18	To DRESDEN	A day crossing Austria and Bohemia.
July 19	DRESDEN	Visit of the art galleries and city sights.
July 20	DRESDEN	Finest municipal abattoirs and stock yards in the world. Veterinary College.
July 21	LEIPSIC	Veterinary Institute under direction of Professor Eber, abattoir and stock yards.
July 22	BERLIN	Veterinary College. City sights.
July 23	BERLIN	Abattoirs and stock yards.
July 24	BERLIN	German Serum Society. City sights.
July 25	BERLIN	Imperial Board of Health Laboratories at Gross Lichterfelde.
July 26	HANOVER	Veterinary College, abattoirs and stock yards.
July 27	To UTRECHT	
July 28	UTRECHT	Veterinary College and University.
July 29,30	AMSTERDAM	Where there will be an opportunity to see how the Dutch keep their land from being overflowed with water, visiting the dykes and locks and the famous art galleries of the city.
July 31	ROTTERDAM	Government Serum Institute.
Aug. 1	LEYDEN	Abattoir and Holstein cattle, art gallery.
Aug. 2	CAMBRIDGE	A glimpse of this great University.
Aug. 3–8	LONDON	Attending the International Veterinary Congress.
Aug. 9	To EDINBURGH	
Aug. 10	EDINBURGH	Veterinary College. City sights.
Aug. 11	THE TROSSACHS	Coaching trips with rides across Loch Lomond and Loch Katrine, one of the most beautiful rural excursions in the world.
Aug. 12	GLASGOW	Municipal abattoirs and stock yards. City sights.
Aug. 13	LIVERPOOL	Sail by single cabin steamer of Leyland Line or White Star Line, $50 berth.
Aug. 22	Due in BOSTON	

PRICE OF TOUR, $595.

WORLDS WORK in Veterinary Science

A digest of all the Current Literature of Comparative Medicine

By DR. L. W. FETZER Washington, D.C.

The Hormones of the Hypophysis in Veterinary Obstetrics

A description of six cases (five cows and a horse) in which a fifteen percent solution of the pituitary body was given in 10 Cc. doses for the purpose of stimulating uterine contractions with good results. In some cases a metritis was also present, in others the fetuses were dead.—H. SCHMITT and M. KOPP, *Münch. Tierärztl. Wochenschr.*, 1913, Vol. 57, No. 35, pp. 649–655.

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Effect of Hypophysis on Growth

Young dogs were fed daily on 0.05 to 0.075 Gm. of the fresh dried and defatted hypophysis of bovines in conjunction with bread and milk. Control animals received fresh, dried and defatted ovarian or testicular substance. The results show that the anterior lobe of the hypophysis has, generally speaking, no growth stimulating properties.—T. B. ALDRICH, *Amer. Journ. Physiol.*, Vol. 30, No. 1/7, pp. 352–57.

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Poisoning with Poppy

Four cows, after receiving their food, became very uneasy, sweated profusely, gnashed their teeth and finally dropped to the floor. After lying on the floor for a time they arose and went through the same cycle as described above. The animals seemed to be in a half-dazed condition, and most of them hardly reacted to a needle prick and became markedly somnolent. Several hours after giving an injection of atropin the animals recovered. The diagnosis of poppy seed poisoning was made.—DR. SOLLEDER, *Münch. Tierärztl. Woch.*, 1913, Vol. 57, No. 33, pp. 617–618.

Foot-and-Mouth Disease Transference Experiments

This details some experiments on the cultivation of the virus of foot-and-mouth disease, and also includes some tests in regard to the transference of the virus to bovines and pigs. All animals infected with the virus became diseased and with a certain number of the animals it was impossible to say whether foot-and-mouth disease was present or not. In no instance, however, was an absolutely typical case of the disease produced. The virus could be again obtained from the artificially infected animals. The relation of smallpox to syphilis and the latter to foot-and-mouth disease is discussed.—V. NIESSEN, *Deutsch. Tierärztl. Wochenschr.*, 1913, Vol. 21, No. 17, p. 257; No. 18, p. 273.

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Biochemistry and Chemotherapy of Tuberculosis

Methylene blue will penetrate the tubercle, stain the living tubercle bacillus, and in some cases kill the bacillus in vitro and in others lessen its virulence. When added to the culture media, a relatively small percentage of methylene blue will inhibit the growth of the human tubercle bacillus. Methylene blue iodide is no less irritant than the chloride, and has less bactericidal power and no greater therapeutic value. The new methylene blues described are various modifications of the methylene blue molecule and have in the main no advantage over methylene blue. New methylene blue GG, however, showed some effect in the one case in which it was used therapeutically and it, with other oxygen derivatives of methylene blue, will be given further tests.

Selenium blue and tellurium blue are new blue dyes in which the sulphur of the methylene blue molecule is replaced by selenium and by tellurium. They are weaker and less stable dyes than methylene blue and more toxic and less bactericidal than that dye. They penetrate the tubercle and are reduced in it and can be reoxidized; they stain the living tubercle bacillus, but more faintly than does methylene blue. In fact, they behave in all respects as weaker editions of methylene blue and have no advantage over it.

Neither methylene blue nor any of the allied dyes, tested by the author, may be said to have much therapeutic influence over experimental tuberculosis of the guinea pig. While methylene blue seems for many reasons a favorable starting point for tuberculosis chemotherapy, other modifications of it and probably many others must be tried before a claim to have found a specific for this disease can be made.—Report of some experimental work on the use of methylene blue and allied dyes in the treatment of tuberculosis, by LYDIA M. DE WITT, *Jour. Infect. Diseases*, 13 (1913), No. 3, pp. 378–403.

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Investigations on the Toxin of Ascarids

A study of the perienteric fluid of the ascarids, sclerostomae, and taenia found in the intestines of the horse, with special reference to their toxic effects.

The perienteric secretion of *Ascaris megalocephala* acts injuriously not only upon animals submitted to experiment in the laboratory, but also upon horses. The secretion of above ascarids contains a toxin. If this secretion be introduced into the eyes of a horse, the secretion causes, in two-thirds of the cases, a local reaction, i. e., swelling of the eyelids, inflammation of the conjunctiva, and lacrimation. In severe cases the local reaction is accompanied by dyspnea, diarrhea, and perspiration. In the course of twelve to twenty-four hours the inflammation of the eyes disappears; generally its intensity diminishes two to three hours after the introduction of the toxic liquid into the eye. The effect of the toxin is various. Some worms have strong toxins and others weak ones; in all cases their presence can be proved even in dilutions of 1 to 5000 by their action on the eyes of horses.

The perienteric secretion owes its virulence not to one substance only but to several; according to Flury's investigations its poisonous nature is due to aldehydes, fatty acids, and their esters. The toxin is very resistant to heat; it passes through Chamberland filters and is partially soluble in alcohol and ether. Its volatile components are also toxic. The blood of horses infested with ascarids contains antitoxins which neutralize weak solutions of ascarid toxin. If the secretion be dropped into the eyes of such horses generally no reaction takes place. Among the other parasites found in the intestines of horses only the sclerostomae produce a poisonous secretion; in the eyes of horses this produces only a slight inflammation.—U. WEINBERG and A. JULIEN, *Hyg. Viande et Lait*, 1913, Vol. 7, No. 5, pp. 225–244.

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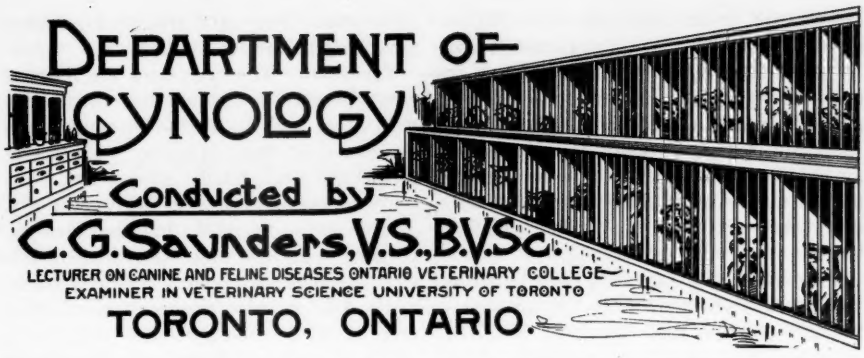
Etiology and Therapy of Equine Influenza

The virus of equine influenza (Pferdestaupe, influenza catarrhalis) is ultravisible and the disease may be transmitted by the blood which has been filtered through a bisque filter. This virus whose period of (artificial) incubation is from three to five days, may remain virulent for quite some time; up to three years in the seminal vesicles of horses. These animals appear perfectly healthy, but during the coital act they infect the mare, and the mare in turn infects other animals in the same stable. The infection may also be transmitted by other intermediaries. If the virus (virulent blood) is kept at room temperature it loses its virulence within three months. The course of influenza is of a benign (save for colts and pregnant mares) nature. Under average circumstances the animal is restored to its normal condition within ten or twelve days. The author believes it strongly desirable to artificially infect all animals (remount) as soon as they arrive at the remount station. This disease cannot be classed solely amongst the infections of the respiratory organs.—E. BEMELMANS, *Centralbl. f. Bakt. u. Parasitik.*, 1st Abt. Orig., 1913, Vol. 68, No. 1, pp. 8–28.



Parasites and Parasitisms

CONTRARY to the popular belief intestinal parasites, unless the infestation is particularly heavy, do not cause any very serious constitutional disturbances. However, large numbers of parasites, especially in puppies, may give rise to alarming symptoms and in some instances even death. Intestinal parasites are detrimental to their host by reason of the irritation they produce, their interference with the digestive process, the deleterious effect of their waste products, the abstraction of blood or by mechanical obstruction. We may, therefore, look for a definite train of symptom when the infestation is heavy.

The general symptoms of parasitism are: a general unthrifly condition of the patient; a rough, dry coat; appetite variable but usually voracious; anemia, gradual emaciation, alternate constipation and diarrhea. Convulsions are common and in certain special cases there is bleeding from the nose. *Pruritus ani* is well marked in cases where the parasites inhabit the rectum. The diagnosis, however, is positive only when the parasites or their ova are detected in the feces. Notwithstanding the comparative harmlessness of parasitism to the patient itself, every means should be employed to rid him of these pests and to destroy their ova and thus prevent their reproduction, on account of the danger from some of them to both man and other animals. Of these Taenia echinococcus and Taenia cœnurus are examples producing respectively hydatid disease in man and "gid" in sheep. Only brief reference to the morphology and life history is given here, the student being referred to the standard works on parasitology for more detailed information.

Spiroptera Sanguinolenta

A small round worm, that inhabits the walls of the esophagus and stomach. The intermediate host is the Blatta orientalis. This nematode worm is readily recognized by its blood-red color, and in addition to its normal habitat as stated above, it may be found in the aorta, lungs and lymphatic glands. Its presence in the esophagus and stomach forms tumors consisting of indurated tissues in which there are chambers containing the rolled up worms.

Symptoms.—Repeated vomiting and rapid emaciation. Sometimes rabiform convulsions.

Ascaris Marginata

A nematode worm. The male 5 cm. to 10 cm. long. The female 9 cm. to 12 cm. long. Color white or reddish white. These worms are more especially common in puppies who may be infested with them at three or four weeks old, but it is at the age of three to four months that they are most abundant. Habitat the small intestine and frequently the stomach.

Symptoms.—Unthrifly coat, emaciation, enlarged abdomen (pot-belly), variable appetite, sometimes convulsions, colics and

constipation or diarrhea. By collecting in rolled up masses they sometimes cause complete intestinal obstruction, which is followed by death. In one case in the author's practice, the stomach and intestines of a month-old puppy were found on postmortem examination to be tightly packed with worms, which, when removed, completely filled a six-ounce medicine bottle.

Treatment.—All solid food must be withheld for twelve hours when capsules containing calomel and santonin, one-half grain of each, should be administered every three hours till purgation takes place. The following prescription has given complete satisfaction to the author in numerous cases:

R

Fluidextracti spigeliæ,
Fluidextracti sennæ, aa.....oz. i

Sig. Give 15 to 30 minims every morning until three doses have been given.

There are many other vermifuges applicable, but whichever one is used a laxative should either be combined with it or administered after the last dose and in every case of worm infestation the treatment should be repeated every two weeks until the feces show no evidence of parasites or their ova. All feces of infested dogs should be burned to prevent other animals from becoming infested.

Oxyuris Vermicularis

A small, white, thread-like worm, male 2 mm. to 3 mm. long; female 9 mm. to 10 mm. long. These parasites inhabit the rectum and cause considerable irritation and anal pruritus; the patient continually drags the anus along the floor to relieve the itching.

Symptoms.—Anal pruritus and the presence of the parasites in the feces.

Treatment.—A laxative should be administered followed by enemas of a saturated solution of sodium chloride or strong infusion of quassia chips.

Anchylostomum Trigonocephalum

The hook worm, white in color; the male is 9 mm. to 12 mm. long; the female 9 mm. to 21 mm. long. These parasites inhabit the small intestines and produce grave symptoms. They are true bloodsuckers, producing pernicious anemia.

Symptoms.—The symptoms are those of grave anemia, a gradual but progressive emaciation and debility. The appetite is unaffected at first, but later on becomes capricious and finally disappears. The coat is staring, the skin scaly and dry. The nose is tumified and becomes excoriated with the muco-sanguinolent discharge. Later a copious epistaxis supervenes, two to three ounces of blood being lost at each attack. These attacks of epistaxis recur at intervals of a few days to several weeks, during which the muco-sanguinolent discharge continues.

In some cases convulsions occur. Intermittent edematous swellings make their appearance on the limbs, which finally become permanently edematous. In the last stage there are ulcerations, gangrenous patches and persistent diarrhea which may give place to dysentery. The course of this condition is extremely chronic, the animals lingering for months or even a year.

Treatment.—When pernicious anemia appears in a pack of hounds extreme care should be taken to thoroughly clean and disinfect the kennels. The sick should be isolated and prevented from soiling the drinking troughs, they should be fed and watered in individual utensils which should be boiled immediately after use, and their feces should be burned.

The anthelmintic which has proven to be of the greatest service is thymol given in large doses and followed up by a saline laxative. Oil of male fern is also very effectual. This latter should be given only after the patient has been fasted for twenty-four hours, having previously received a purgative. Six to eight hours after the exhibition of the male fern a saline purgative should be given to clean the intestinal canal. The strength of the patient must be carefully maintained by nutritious and easily digested foods, milk, raw meat, with tonics of iron and a bitter tonic such as quassia or gentian.

Tricocephalus Depressiusculus

A white worm 45 mm. to 75 mm. long. This parasite inhabits the cecum of the dog and is often found in conjunction with

the Anchylostomum trigonocephalum. It produces anemia and often typhlitis appendicitis.

Treatment.—The same as for Anchylostomum trigonocephalum.

Taenia—Tapeworms

The tapeworms most commonly met with in the dog are only here mentioned and the reader is again referred to works on parasitology for a more extended decription. The table given below gives the name, the intermediate host and the larval form:

Name	Length	Intermediate Host	Larval Form
Taenia Serrata	50 cm. to 2 m.	Hare and rabbit	Cysticercus pisiformis
T. Serialis	45 cm. to 75 cm.	Rodents	Coenurus serialis
T. Marginata	1.5 m. to 2 m.	Ruminants	Cysticercus tenuicollis
T. Coenurus	50 cm. to 75 cm.	Sheep	Coenurus cerebralis
T. Echinococcus	4 mm. to 5 mm.	Man, swine, ruminants	Echinococcus polymorphous
T. Canis	10 cm. to 40 cm.	Louse and flea	Cryptocystus trichodectis
T. Krabbei	1 m.	Reindeer	Cryptocystus serraticeps

Of these tapeworms the most important from an economic standpoint are the Taenia echinococcus and the Taenia coenurus. The first producing hydatid disease in man, the second "gid" in sheep.

The symptoms of tapeworm infestation are those of general parasitism and the diagnosis is positive when the segments are found in the feces.

Treatment.—Consists in thoroughly preparing the animal by fasting and laxatives and the administration on an empty stomach of oil of male fern m. 15 to one dram, followed in eight to ten hours by a saline cathartic in full doses. The expelled parasites should be carefully examined to ascertain if the head has been expelled and if not the treatment should be repeated in ten days. The same precautions as to burning worm segments and the bowel discharges must be taken as mentioned before in this chapter.

Poisons

Poisoning in the dog may be accidental or intentional. The former may come about by the animal picking up poisoned meat or other food laid down for vermin, or the patient may show symptoms after an overdose of some drug given empirically. Some animals show a great susceptibility to the action of some drugs, notably strychnine, symptoms of poisoning appearing after even moderate medicinal doses. Poisons cause death

1. By their corrosive or tissue-destroying properties;
2. By their physiological action;
3. By a combination of (1) and (2).

Poisoning in canine patients, whether intentional or accidental, is only too often fatal, the quantity of the drug ingested in nearly every case being so large and the patient's condition often not discovered till irreparable damage has been done. The usual portals through which poisons are absorbed are the respiratory and digestive system, with air or food. Occasionally they are absorbed through wounds in the skin.

Pathology of Poisoning

Local Effects.—These are the results of the action of the poison on the living cells with which it comes in contact and consist of more or less violent irritation, varying in degree from congestion or inflammation to mortification, and which local effects react on the whole system, giving rise to fever, collapse, etc.

Absorption.—The rapidity with which poisons are absorbed depends to a great extent on the poison itself, the portal by which it gains entrance to the animal's economy, the condition of the digestive tract whether full or empty, and also the nature of the stomach contents. For instance, the unbroken skin will easily and rapidly absorb gases, but solids or liquids hardly at all; on the other hand, irritated or wounded skin becomes very absorbent.

Again, an empty stomach will absorb far more readily and rapidly than a full one, and yet, again, the digestive tract just after a meal of fatty substances, even milk, is far more impenetrable than when a meal with no fat has been partaken of. The exception to this is phosphorous, the absorption of which is accelerated by oils and fats.

Elimination.—Poisons are eliminated in the excretions. Nearly all mineral poisons are eliminated through the kidneys, some by the bowels. Gases, vapors, and volatile poisons are eliminated by the lungs. Some poisons undergo changes during elimination, others are eliminated unaltered.

Treatment.—The main objects to be attained are to delay or prevent absorption, to neutralize the poison or render it insoluble, to eliminate from the system both what is absorbed and what is unabsorbed, and to counteract the effects produced by the poison absorbed and the resulting lesions.

The first can be accomplished by emetics and purgatives, the former by reason of their rapidity of action being the most valuable. Purgatives are chiefly valuable when combined with agents that retard absorption or with those that unite with poisons and form an insoluble or inert compound. Antidotes act in three ways: they neutralize the poison, render it insoluble, or arrest its injurious effects.

Arsenic

Arsenic, or, rather, arsenious acid (arsenic trioxide), is one of the commonest of vermin poisons, and dogs are frequently poisoned on that account. Dogs may also become poisoned by the arsenic in an overdose of Fowler's solution given for medicinal purposes.

The toxic dose of arsenic is two grains. Arsenic is a corrosive irritant producing gastro-enteritis with its corresponding effects.

Arsenical poisoning may be acute or subacute.

Symptoms of Acute Arsenical Poisoning.—There appears suddenly about an hour after ingestion profuse salivation, swallowing movements and great thirst. The patient is restless and anxious, with convulsive action of the lips, acute colicky pains, and vomiting. There is great pain over the epigastric region, and intolerance to pressure, at first there is constipation, which later on gives way to a fetid dysentery. The pulse at first is full, but soon becomes small, irregular and imperceptible; respiration difficult; urine scanty and often bloody; the temperature is subnormal and the extremities cold. Later on rigors set in with weakness and paresis, the gait is staggering, the pupils dilated. The pain is excruciating, and the animal dies in a state of collapse in from four to five hours.

Subacute Arsenical Poisoning. — The symptoms are much the same as in the acute form, but not so violent. There is dryness of the mouth, great thirst, colicky pains, vomiting, fetid diarrhea and tympanites. The mucous membranes are pale, the pulse irregular but frequent, the urine scanty. These symptoms may persist for about twenty-four hours, when the patient, seems to improve. This improvement however, is short-lived, the patient soon relapsing and becoming worse. There is great depression, weakness, he is unable to stand; there is dyspnea, and the pulse is weak and almost imperceptible. Convulsions may occur or the patient may lapse into coma. There may be edema of the eyelids and dependent parts; paralysis of the hindquarters then sets in, and death follows in a day or two.

Treatment.—Emetic.—apomorphine, gr. 1-20 to gr. 1-10 and antidotal.

Antidote: Sesquioxide of iron prepared by precipitating tincture of iron perchloride with an alkali. Large amounts of peroxide of iron should be given every twenty minutes or so, followed up by a purgative of magnesium sulphate. Tincture of iron perchloride, three oounces, sodium carbonate, one ounce, dissolved in water and mixed together will produce sufficient peroxide of iron to neutralize ten grains of arsenious acid. Insoluble arsenate of iron is formed and is swept out by the magnesium sulphate.

In acute cases hypodermic injections of morphine every half hour will retard absorption and ease pain, later on and in subacute cases opium combined with a demulcent

has the same effect and tends to soothe the inflamed mucous surfaces. To hasten elimination Spiritus Etheris Nitrosi in full doses well diluted with water should be given. Collapse must be combated with stimulants.

Phosphorus

Phosphorus poisoning in dogs is usually accidental, and due to their picking up pieces of bread or meat smeared with vermin paste of which phosphorus is the chief constituent.

Symptoms.—The first symptoms of phosphorus poisoning generally appear about an hour after the ingestion of the poison. Manifestations of acute gastritis, increased flow of saliva, acute pain, bloody diarrhea, extreme prostration, convulsions and coma occurring in rapid succession and also garlicky odor of breath and icterus complete the clinical picture. If the patient is taken into a darkened room, his breath, feces and urine appear luminous. If the patient survives the acute symptoms, fatty degeneration, chiefly of the liver, takes place, from which the animal may die later on.

Treatment.—An emetic of copper sulphate, two grains, in water should be given and repeated until the stomach is completely emptied. Copper sulphate is both an emetic and an antidote for phosphorus, forming an insoluble phosphide of copper. After all the poison has been ejected by vomiting that it is possible to eject in this way, demulcents and opiates should be given, but on no account should oil or milk be used, as they hasten the absorption of the phosphorus. To counteract the extreme prostration and collapse associated with phosphorus poisoning, subcutaneous injections of strychnine sulphate gr. 1-200 to gr. 1-60, or spirits of camphor, one-half to one ounce should be given.

Strychnine

Strychnine poisoning is probably the most common form of poisoning with which the veterinarian has to deal. The dog poisoner generally chooses this powerful alkaloid to attain his nefarious object. In addition canine patients are extremely susceptible to strychnine and poisoning frequently results from overdosage of this drug. These latter cases, however, are usually quickly amenable to treatment, in malicious poisoning, on the other hand, the mortality is high on account of the massive doses employed.

The length of time which elapses before symptoms of poisoning appear after the ingestion of toxic quantities of strychnine varies considerably, depending on the nature and amount of food in the stomach. Absorption is retarded by a full stomach and by food stuffs of a fatty nature. The author has records of a case in which this delayed absorption is well illustrated. The patient on her return home was given a bowl of milk, after which she was under continual observation till the symptoms of strychnine poisoning developed, a period of four hours. The dose in this instance must have been a large one, as the bitch was saved only by heroic doses of H-M-C, being kept narcotized for twenty-four hours.

Symptoms.—Uneasiness and an anxious expression, panting; followed by acute tetanic spasms at varying intervals. The spasms affect the whole body, the limbs become stiffened, the animal is unable to stand and falls to the ground. The jaws are in a state of trismus, the lips being drawn back, especially at the commisures producing the characteristic "risus sardonicus." The spine is curved (kyphasis), inspiration is labored and the mucous membranes are cyanotic. The eyes are prominent, the pupils dilated, the heart action tumultuous, and the pulse small and quick, but the artery full and hard. After the spasm, the muscles relax and the foregoing symptoms abate until another paroxysm sets in, and these become more and more frequent with shorter intervals until ultimately the patient dies from asphyxia during one of the convulsions.

Treatment.—An emetic of apomorphine hydrochloride, gr. 1-10 to gr. 1-20 hypodermically, should be administered immediately, to produce prompt vomition of the unabsorbed portion of the poison. No matter what treatment is resorted to for the purpose of allaying the spasms, this emetic must be given first of all; unless the

quantity of strychnine ingested be very small, all other treatment is futile, and a fatal termination certain if this be neglected.

If the patient can swallow, the emetic may be followed by a liberal dose of oil. To control the spasms, the animal must be chloroformed, or an intravenous injection of chloral hydrate may be given. Large doses of morphine sulphate subcutaneously may also be used; but the treatment that has given the best results, and has in addition the advantage of easy administration is the hypodermic injection, after the production of emesis, of from three to five tablets of H-M-C (No. 1). The main object is to keep the patient free from spasms until the poison is eliminated. These injections of the H-M-C tablets should be repeated in sufficient dose to attain the result, the procedure being entirely without danger. The patient when completely narcotized should be placed in a dark and quiet place and all noise and excitement avoided or a return of the paroxysms will result.

Hydrocyanic Acid and Potassium Cyanide

These poisons are sometimes used by the dog poisoner, the latter being the more used of the two.

Symptoms.—The rapidity with which this poison usually acts does not allow of the development of definite symptoms, but when relatively small toxic doses have been given (luckily the commercial potassium cyanide is often impure) the following symptoms appear in a few minutes after the ingestion of the poison:

Great distress, difficulty in breathing, head and neck extended and convulsive movements of the fore limbs. The patient next falls on his side and goes into convulsions, the spine being alternately arched (kyphosis) and curved (lordosis). There is champing of the jaws, an increased flow of saliva, spasms of the diaphragm, asphyxia and death.

Treatment.—Death usually takes place so quickly as to preclude treatment, but if there is time, apomorphine hydrochloride, gr. 1-10 to gr. 1-20, should be given for its emetic effect, and the poison neutralized with a solution of iron sulphate, grs. 10, in water. Complete anesthesia should then be induced by the administration of ether.

Carbolic Acid—Phenol

Dogs are extremely susceptible to the effects of carbolic acid and are often poisoned by being washed in strong solution for the eradication of vermin, or by licking wounds to which carbolic dressings have been applied.

Symptoms.—When taken by the mouth the caustic action of carbolic acid is observed by the stomatitis, pharyngitis and gastro-enteritis, which it produces. The mucous membranes that have been touched by it appear white in patches. When phenol is absorbed into the general circulation the following symptoms appear:

The patient is anxious and distressed; there are fits of rigors and convulsions followed by paralysis of the hind quarters; the pulse small, irregular and barely perceptible. The respiration is quick and difficult; the temperature subnormal and the urine high colored.

Treatment.—Alcohol neutralizes carbolic acid, and in addition is a stimulant. It should be given in full doses, one to two ounces, or if it be obtainable give gin, one to four ounces. A full dose of sodium sulphate should then be given for a purgative. This also in a measure neutralizes the poison. The inflamed mucous membranes should be soothed by the administration of oil or demulcents.

Iodoform

Poisoning from this agent is usually due to absorption from wound dressings or from the patient licking wounds that have been dressed with iodoform.

Symptoms.—Gastric disturbances, vomiting, constipation and convulsions alternating with coma are produced by the ingestion or absorption of toxic quantities of iodoform. In some cases there is great excitement and difficult breathing. The pulse is irregular.

Treatment.—Eliminate by emetics and give starch to form insoluble starch iodode.

The foregoing list of poisons comprises those usually met with in practice; for a more extended list the reader is referred to special works on toxicology.

POINTED OPINIONS by Readers ON LIVE TOPICS of Veterinary Medicine

It is in reports like those of this department that the current history of the progress of veterinary science is written. Are you leaving a record of your experience which will help others, as you have been aided by these and other clinical reports? If not, you are earnestly invited to contribute from your experience that this department may be of the greatest service to its readers. By so doing you will earn the thanks of the editor, the approval of the veterinary profession and the lasting gratitude of those who are aided by your suggestions.

Factors in Successful Anti-Hog Cholera Vaccination and Serum Production

The season has witnessed expensive outbreaks of hog cholera in various sections of the middle west. In some parts of this territory practically every hog has died, and all of this in spite of the fact that enormous quantities of antihog-cholera serum have been used in the infected territory. Some of this enormous loss may be ascribed to the fact that veterinarians were in many instances unable to procure serum, as practically all serum plants were flooded with orders which they were unable to fill, or the filling of which was delayed. Aside from this all veterinarians will admit that in several outbreaks the use of antihog-cholera serum was not always attended by success.

The agricultural press and the layman have undoubtedly been impressed too greatly with the supposed curative properties of the serum, and being disappointed in this respect it has resulted in the wholesale condemnation of the serum, or simultaneous method of vaccination in many quarters. As contributary causes for poor results following vaccination with antihog-cholera serum the following factors may be submitted:

1. Insanitary and unhygienic surroundings.
2. Vaccinating at the wrong time.
3. Improper or careless vaccinating.
4. Improperly prepared or tested serum.

I. *Insanitary and unhygienic surroundings* have an important bearing upon the success of vaccination. It is altogether too common to confine hogs in dirty, filthy pens or enclosures; frequently in low, poorly-drained areas, which receive most of the seepage from the remainder of the barnyard. The belief that hogs thrive in such surroundings is so firmly rooted that it is very difficult to contend with it. Experienced hog raisers nevertheless state that if a hog is given its choice of clean, sanitary surroundings, and insanitary, filthy surroundings, it will naturally choose the former. Many hog-houses protect the animal but poorly from draughts and undue exposure during the winter months. Veterinarians know that the hog is more than ordinarily susceptible to the usual forms of pneumonia, and such surroundings increase this susceptibility. Feeding kitchen refuse, which is often liberally diluted with dish water, usually containing a comparatively high percentage of caustic alkalies, cannot but have a devitalizing influence. The gravity of such conditions is greatly increased when the animal's resistance is temporarily lowered following vaccination by the serum-simultaneous method. Therefore, especially following this method of vaccination, in order to insure the greatest possible success, the veterinarian should insist upon placing the animal in clean pens

or pastures, with a plentiful supply of wholesome food and clean, pure drinking water; during cold, wet seasons they should be properly housed.

II. *Vaccinating at the wrong time.*—This paragraph consists largely of a series of "don'ts." Very small or runty pigs do not stand serum-simultaneous vaccination well, when the virus is used in quantities sufficiently large to protect them for the remainder of their life. The writer believes that when pigs are thrifty, weighing from 50 to 60 pounds, it is the best time to immunize them. When sufficiently large doses of virus are used on very small pigs it frequently sets them back or they remain runty and unthrifty. Sows in advanced pregnancy should not receive virulent blood; in view of the fact that simultaneous vaccination produces a mild form of cholera, it is only reasonable to expect that abortion may result, the same as following a natural outbreak of the disease. When there is cholera in the herd do not use the simultaneous method, but give serum alone, which may be followed in two or three weeks by the serum-simultaneous method; in addition, animals showing no symptoms of the disease, but having a high temperature, are frequently too far advanced to be benefited by vaccination; to the layman such a hog appears healthy, and if no temperature is taken the chances are that the veterinarian also will overlook the condition; needless to state that the animal dies, as serum is not effective following the sixth day of incubation, and the owner promptly loses faith in vaccination.

III. *Improper or careless vaccinating.*—The conditions under which the veterinarian is frequently compelled to work are not conducive to first-class work. Especially during the summer months, it is not at all uncommon to have hogs taken out of a filthy wallow just before being vaccinated; it is almost impossible, at least impractical, to cleanse these animals so that abscesses will not form at the point of inoculation. Attempts should nevertheless be made to thoroughly scrub the operative area with some soapy disinfectant as *Liquor Cresolis Compositus*; a stiff-bristled brush, using plenty of disinfectant, is advisable. Syringes and the operator's hands should repeatedly be cleansed in the disinfectant, and the serum and virus protected from dust, flies and other forms of contamination. A united effort is now being made to have animals inoculated in the axillæ, instead of in the hams, as the latter are so frequently the seat of abscesses following vaccination, these abscesses sometimes are not detected until the ham is cut into; the axilla offers less expensive cuts, and the economic loss is not so great. It is a common practice to administer doses of serum that are too small, in order to save expense; if anything, the dose should be too large rather than too small, as partial protection from small doses, with the fancied security against future infection, is worse than no protection at all.

IV. *Improperly prepared or tested serum.*—In view of the fact that at the present time no practical method of standardizing antihog-cholera serum has been devised, it is essential that every factor be considered and taken advantage of in the manufacture of this product. In the writer's opinion the following facts, amongst other things, in the manufacture of antihog-cholera serum should be considered:

(a) Virus from acute cases of hog cholera should be used; if cholera has existed for two weeks or longer there is greater danger that secondary diseases have developed.

(b) Virus hogs should have a temperature of from 104.5° to 106° F. in winter, and from 106° to 108° F. in summer.

(c) Virus intended for hyperimmunization should be used within twenty-four hours after it is drawn, and all virulent blood that is slow in defibrinating should be discarded.

(d) Hogs that are used for serum manufacture should at no time following hyperimmunization have a temperature above 103° F., and they should increase in weight at least five pounds between bleedings.

(e) All serum should be tested, and the check pigs used in this test should die in from seven to ten days.

(f) Virus for immunization may have one-half of one percent of carbolic acid

added to it, and should be used within fifteen days from the time it is drawn.

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ABSCESS OF THE PRESCAPULAR LYMPH GLANDS

Those hot, painful, diffuse swellings which not infrequently occur on the shoulders of draft horses, are often due to abscess formation in the prescapular lymph glands. The fact that the swelling shows no fluctuation at the center is good evidence that the inflammatory focus is deep-seated and is a means of diagnosis.

The prescapular lymph glands lie between the mastoido-humeralis (levator humeri) muscle externally and the thin omohyoideus (subscapulohyoideus) muscle internally. They are so placed that the collar presses on them during draft. It is reasonable to presume that this form of mechanical irritation long continued may reduce the resistance of the glands so that they form a favorable place for the growth of such pus-producing organisms as may have wandered from cutaneous shoulder galls or other wounds in the vicinity (metastatic abscess).

Lameness may or may not develop, but if it does it disappears after a few days' rest. At the same time the swelling subsides, but reappears shortly after the horse is again put into the collar. Unless the accumulated pus is released this may continue for weeks and lead to a marked *false hypertrophy*, due to an increase in the connective tissue of the mastoido-humeralis muscle.

Treatment in these cases is purely surgical, but must be delayed until the acute inflammatory symptoms in the skin and muscle have subsided. The horse should be cast or otherwise restrained and the field of operation shaved and disinfected. A free incision about four inches long is made through the swelling parallel to the long axis of the scapula. Indurated muscular tissue should be extirpated. Especial care must be taken to cut away the muscle directly overlying the lymph glands. Usually the sero-purulent exudate is surrounded by a tough, tightly stretched capsule. When this is punctured the contents will squirt out with considerable force.

After-treatment is simple. Where much tissue has been removed or where hemorrhage is profuse, a pack of moist bichloride gauze should be sutured into the cavity. After thirty-six hours the gauze may be removed, the cavity irrigated with an antiseptic solution and treated as an open wound.

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THE ADMINISTRATION OF CHLOROFORM TO HORSES STANDING*

In this age of motors and flying machines when, according to some people, the horse is fast becoming extinct, it may seem a waste of time and energy to discuss such a subject, but when one considers that a yearling colt can still fetch *5000* guineas in the public market and that *45,000* guineas is paid for a sire, and in fact that a horse is worth as much money as he ever was, and that many such valuable animals come within our domain for various operations, the importance of his care and control during such operations, is well worthy of our serious consideration. Moreover, as a scientific profession we are expected to keep pace with the march of science, and to be ever ready and anxious to take advantage of the most up-to-date scientific methods in the practice of our profession.

Further, the veterinary surgeon is more or less expected to be a lover of horses, and as such to be anxious to adopt the most humane methods as against the crude and barbarous ones often employed. I am not here to discuss any particular operation or form of operation, my remarks apply to all operations requiring the animal to be in the recumbent position.

In the performance of operations on horses one has to take precautions to have the animal under such control as will prevent the possibility of risk to the operator and his attendants, and also lessen the risk

*Reprinted from *The Veterinary Record.*

of injury to the animal itself; it is only thus that one renders possible operations that could not otherwise be attempted.

It will scarcely be disputed that most, if not all, surgical operations will be much more happily performed if the animal is under the influence of an anesthetic. There are several useful preparations that induce local anesthesia, but for all important operations one wants the animal in complete anesthesia, and the only general anesthetic for horses, so far, is chloroform.

Now, as I have already said, it will scarcely be disputed that all important operations on the horse in the recumbent position are easier for the operator and ever so much happier for the horse and the person who owns him if he is under the influence of chloroform; and yet the use of chloroform is by no means general in the veterinary profession. Why this should be so, it is difficult to explain, and still more difficult to understand.

A bill is being promoted in British Parliament to make compulsory the use of chloroform in certain important operations on the horse, and judging from the columns of a English veterinary press, the introduction of this bill created a scare, and almost a panic in the ranks of the veterinary profession. Members have written to condemn the use of chloroform, who have never mastered the use of it; and who possibly through fear compel themselves to be blind to its advantages.

I rather think that the present restricted use of chloroform is due to a misconceived and highly exaggerated notion of the dangers supposed to be inseparable from its use. Doubtless those ideas of great danger arose from the experience of the very painful and sometimes prolonged and dangerous struggles that are observed when horses are undergoing the effects of chloroform after they have been already cast and hobbled. By administering chloroform while the horse is standing, there are none of those painful struggles, and the dangers, if any, are reduced to a minimum.

It has been my practice now for many years to give chloroform standing to horses of all ages, and for all operations, and I have never seen any ill results, though I have operated on hundreds of horses and often with very little help and under very adverse circumstances.

I have heard from practitioners of some cases of collapse and death, but the horse that won't stand a dose of chloroform can scarcely be considered a loss, and must be such a very bad case of heart disease that he is better dead.

In general practice one has to deal with untrained or unhandled horses as well as with trained ones, and it is with the wild young ones that this method of administration is particularly useful.

Now I know that some of our great men will, and do, ridicule the very idea of asking a veterinary surgeon to deal with an unhandled horse. They think it is almost *infra dig.*, and they will say a veterinary surgeon must not be a horse trainer or a horse tamer; but without requiring him to be either, I fear that he cuts a rather sorry figure at times if he cannot show that he knows how to handle a horse, or at least direct how it should be done; and it will not take from his dignity either as a man or as a practitioner if he is capable of doing it himself.

Trained or untrained, the horse will always be best in an enclosure, and when convenient in a good sized loose box. He should, of course, when possible, be fasted over night.

I find that a good firm grip of an ear will quiet most young ones; but the ear must be held once it is gripped.

You can now put on the halter, and if the horse is a very wild one, it is perhaps easier to put on the chloroform muzzle at the same time.

My chloroform muzzle is simply a leather bag with a strap to go over the head and with a slit at the side to permit a large sponge. It is not an elaborate affair, and there is nothing that can do harm. The muzzle fits into the mouth and covers the nostrils well. I prefer the muzzle in the mouth as I think it may prevent the tongue being injured by the teeth squeezing on it when the animal is under the influence of chloroform.

But any kind of muzzle will do; in fact anything that will exclude the air and hold

a sponge or wad of wool on which to pour the chloroform. I have more than once used a small sack, or made a muzzle by folding a cotton flour sack or towel and tied it on to the head collar.

You may elect to operate in the loose box or outside, as you please, the procedure is the same, and for all horses. There is no doubt that when the box is suitable the horse is quieter and goes under more readily.

If you are to have the horse outside see that your halter and lead are sound, and instruct your assistants not to let the horse get away if he happens to make a plunge.

Having adjusted the muzzle you simply pour the chloroform on your sponge or wad of wool, and place it in the muzzle. For yearlings I always pour on about two ounces; for an extra strong or wild one and for a two-year-old two and one-half to three ounces; and for three-year-olds, and for trained horses, always begin with three ounces.

There is little need to measure exactly the amount, you can easily accustom yourself to make a fair guess, by noting the amount in the bottle with your fingers. After about three minutes the animal begins to show signs of becoming dazed, the eyes stare, and you will soon notice that he cannot see.

With animals in a loose-box, they seldom move at all, but horses outside may step backwards a few yards, or occasionally try to walk on. Seldom will one plunge, and I don't remember that I have seen one rear, which is the great danger alleged by those who have not tried. Sometimes, just as a horse gets the first sniff, and perhaps before you have secured the sponge, he may plunge, and you may have to get his ear held till you have secured the sponge in the muzzle.

Once the sponge or wad saturated with chloroform is secured in the muzzle, the trouble is over. If the horse is restless, let him walk round in a circle, but don't let him get away; it is at least as easy to hold him now as it would be without the chloroform.

When you notice that the horse is going under, you may now strap up a fore leg; that will generally induce him to kneel down, and in another minute he will lie down, or you may push him over.

I have seen horses lie down in four minutes, and I have seen some not go down for eight or ten minutes, but in no case have I ever seen any struggling after they had gone down, and a horse will lie quietly for seven to fifteen minutes without further restraint. Of course, when the operation is a prolonged one you must administer further chloroform as required.

You may strap up the fore leg before giving the chloroform, but I prefer to do so after I see the horse is getting dazed.

Now as it is necessary in most cases to fix a limb or limbs, so as to keep the animal in a particular position, and as such fixation has to be done with hobbles, I find it is much easier and more useful to put the hobbles on the horse before he goes down. In fact, my practice now is to put him down and not to wait till he lies down; and, further, you can put him down exactly where you want to. I always use the ordinary colt rope, or side lines, and for all horses.

Some horses may, when left to lie down, remain long on their knees before going over, and may even require a larger dose of chloroform, but I find that with the doses I have described, the horse is dazed in three to five minutes, and by putting on your ropes, you can induce him to lie down without trouble, and that once he is down there is no further struggle, and he is fit for surgical operation immediately.

You, of course, leave the muzzle on during operation, and remove it at once when the operation is finished. Remove your hobbles quietly, and let the horse lie as long as he cares to.

When the operation has not lasted more than ten minutes, the horse is generally ready to get up in a few minutes, and when he is on his legs for two or three minutes he is perfectly recovered from the effects of chloroform.

Those after effects that one hears so much about must, I think, exist only in the imaginations of those who have described them. I have never seen any such, and I have had horses down for forty minutes, and used five to six ounces of

chloroform. When the operation has been a long one, it is best to induce the horse to lie as long as possible. With ordinary care there is little danger from overdose or after effects.

In 1897, at the request of his lady owner, I destroyed with chloroform the celebrated thoroughbred sire "Turco," and he inhaled eleven ounces of chloroform before he was dead.

I have seen a yearling colt gallop and jump a four-foot wall two or three minutes after he stood up from the operation of castration, though he was sufficiently under to be operated on without a hobble.

I have on a previous occasion given the record of a number of cases of colts, one and two years old, for the operation of castration. The average amount of chloroform used was two and one-half ounces, and the average time taken with the operation was seven minutes. All those colts were allowed to go under without pulling down with hobbles, and were operated on with the upper hind leg just pulled out of the way with a web lead.

I have castrated stallions up to *fourteen years old*, and have performed various other operations on old horses, and have given all chloroform standing. Under ordinary circumstances, and with ordinary care, by this method you can, with two boys, easily manage an operation.

I do not claim to belong to the brigade of lightning operators, or acrobatic surgeons, but I have castrated a two-year-old thoroughbred colt in his loose-box, given chloroform standing, and did not use hobbles, and was only *eight minutes* on the premises.

I fear I would only bore you with statistics; I have tried to give you a description of the method that has been, with me, a great success. I fear I have not been able to give you a very brilliant, or a very graphic description, but I hope I have given sufficient to dispel from your minds that there is any mystery about giving chloroform to horses standing, and I hope that what I have said may induce you to give this method a fair trial, and I am certain you will be convinced of its advantages.

Who has ever watched a horse being thrown with the ordinary chain and hobbles without feeling that he got a great, unmerciful, unnecessary heave, which made one feel and wish there could be a happier method. And who has watched the struggles of a horse when undergoing the effects of chloroform after he has been hobbled and thrown, and not thought that the horse is suffering more by the process than he may from the surgical operation that he is about to undergo.

Chloroform standing is, I believe, the ideal method; and I am strengthened in that belief by the good accounts that I hear from those whom I have induced to try it. Don't be disappointed with a failure or two, persevere, and get confidence in yourself, and once you get expert in the administration of chloroform you will do away with a lot of hard labor in your work, and you will by its more general use advance the practice of our profession on a scientific basis, and as I have repeatedly said, you will in that way do more to exterminate quackery than could ever be done by Act of Parliament.

P. J. HOLLAND, M. R. C. V. S.
Ennis, England.

JOIN THE AMERICAN VETERINARY MEDICAL ASSOCIATION

I wish to call the attention of veterinarians, not members of the American Veterinary Medical Association, to the advantages the association offers and suggest a few of the many reasons why you should join it.

The American Veterinary Medical Association includes in its membership the leading veterinarians of the United States, Canada and the Philippines and the foremost veterinarians and scientists of Europe are among its honorary members. A membership in the association will bring you in contact with these men and you can get the best they have to offer. You cannot afford to miss this, for it will increase your interest in the profession and help you financially.

The American Veterinary Medical Association has just completed a half century

of successful work and gives promise of a more successful future.

Plans are now being perfected for a reorganization of the association that will make it more efficient along all lines.

The American Veterinary Medical Association has taken the lead in attempting to secure legislation that will greatly increase the efficiency of the Army Veterinary Service and obtain proper recognition of the army veterinarians. This important and greatly needed legislation will soon be passed by Congress.

The American Veterinary Medical Association has been of great assistance in raising the standard of veterinary education and advancing the interests of the profession generally.

The fees are low and you will find the splendid annual reports, which you will receive free, filled with the latest and best information available along all lines in veterinary science and practice.

I particularly urge upon recent graduates and all others who want to keep right up to date to join this association. It will be of great help to you and you can be of much assistance to the Association. Graduates of the following veterinary colleges are eligible to membership:

Alabama Polytechnic Institute, College of Veterinary Medicine.
Chicago Veterinary College.
Cincinnati Veterinary College.
Colorado State College, Division of Veterinary Medicine.
George Washington University, College of Veterinary Medicine.
Grand Rapids Veterinary College, including only those who have pursued a course at this college or some other accredited college for three years.
Indiana Veterinary College.
Iowa State College, Division of Veterinary Medicine.
Kansas City Veterinary College.
Kansas State Agricultural College, Veterinary Department.
McKillip Veterinary College.
Michigan Agricultural College, Division of Veterinary Science.
New York-American Veterinary College.
New York State Veterinary College.
Ohio State University, College of Veterinary Medicine.
St. Joseph Veterinary College.
San Francisco Veterinary College.
State College of Washington, Veterinary Department.
Terre Haute Veterinary College.
United States College of Veterinary Surgeons.
University of Pennsylvania, School of Veterinary Medicine.
University of Toronto, Ontario Veterinary College, to include only those graduated during or prior to 1913.

Provision is also made for older graduates in Sec. 4 of the bylaws as follows:

A veterinarian, graduate of a veterinary college, which at the time of his graduation did not maintain educational standards in conformity with the active membership requirements of this association, may, upon recommendation of the Executive Committee, be elected to membership, provided he has been duly graduated not less than five years prior to the date of application, and further, that the college has now ceased to graduate veterinarians contrary to the standards now fixed by this association.

A list of resident secretaries was published in the December issue of this journal and you should write your state secretary for application blanks. If you wish further information regarding the association, write the Secretary, who will give it prompt attention. Join now and attend the New Orleans meeting in December, 1914.

N. S. MAYO,
Sec'y.

4753 Ravenswood,
Chicago, Ill.

PROGRESS OF VETERINARY SCIENCE JUDGED BY VETERINARY PUBLICATIONS IN U. S. AND ENGLAND

In a recent article, which I have read, it was stated, that over 500 discoveries have been made during the past twenty-five years, which evolutionized transportation, agriculture, medicine, astronomy, etc. Veterinary medicine was not mentioned, while, as a matter of fact, it has made greater strides proportionately than any other science during this period.

The following is an extract from *The Chicago Tribune:*

WHY TEACHERS MARRY THE FIRST MAN WHO PROPOSES

The greatest use of the small lake is that when the fish die, gases are formed in their bodies, and large cities like Pittsburg are lighted by this natural gas.

Q.—Describe the purpose of the bones. A.—The purpose of the bones are if we didn't have any

we couldn't walk or anything. We would all cave in.

Q.—Describe the location of the heart. A.—The heart is located in the northeast quarter of the stomach.

When I commenced handling veterinary literature, in 1890, many so-called "veterinarians" could not have given answers to questions pertaining to the science of veterinary medicine any more intelligent than the foregoing. The large majority of practitioners in the United States at that time had hardly any school education, and knew very little of anything at all about anatomy, physiology, pathology, or chemistry. I base this statement on correspondence and inquiries I received pertaining to these subjects. Today ninety-five percent of the practitioners are well versed, intelligent, and cultured men.

The important standard textbooks known to the English speaking veterinary world twenty-five years ago, and which were then considered up to date, used as textbooks in all schools, were the following: Chauveau's "Comparative Anatomy of Domesticated Animals," Strangeway's "Veterinary Anatomy," F. Smith's "Manual of Veterinary Physiology," Finlay Dun's "Veterinary Medicines, Their Actions and Uses," Robertson's "Equine Medicine," W. William's "Veterinary Medicine," W. O. William's "Veterinary Surgery," Steele's "Cattle Practice," and Fleming's "Veterinary Obstetrics." Others that were used for reference were: Gresswell's "Diseases of the Horse," Fleming's "Treatise on Practical Horse Shoeing," Walley's "Four Bovine Scourges," Percivall's "Hippopathology," Gangee's "Theory and Practice," and Youatt's work on dogs. All of the above works were published in England. There were a few others of minor importance, but the veterinarian of that day that possessed fifteen standard veterinary books was considered to have a well-equipped veterinary library.

How does this compare with today? The veterinarian in order to have the ground fairly well covered, and be up to date, must now have at least eighty volunes in his library.

The first books that were strictly American and up to date, were: R. Mead Smith's "Physiology," and Liautard's "Lameness of Horses;" the next one, issued in 1891, was: "Liautard's Manual of Veterinary Operative Surgery." These were followed by a number of important scientific books, both English and American, appearing in succession, as follows:

Anatomy.—M'Fadyean's Anatomy of the Horse," M'Fadyean's "Osteology and Pathology," Cuyer's "Artistic Anatomy of Animals," Bradley's "Outlines of Veterinary Anatomy," Leisering's "Atlas of Anatomy," Johne's "Surgical Anatomy of the Horse," and Sisson's "Text-book of Veterinary Anatomy."

Surgery.—Fleming's "Operative Veterinery Surgery," Cadiot's "Exercises in Operative Surgery," Moeller and Dollar's "Practice of Veterinary Surgery," Wyman's "Catechism of Surgery," Merillat's "Principles of Veterinary Surgery," Merillat's "Textbook of Surgical Operations," Udall's "General Veterinary Surgery," and W. L. William's "Surgical and Obstetrical Operations."

Physiology.—Paton's "Essentials of Physiology," and a new, revised edition of Smith's "Veterinary Physiology."

Materia Medica and Therapeutics.—Gresswell's "Pharmacopoeia," Quitman's "Synopsis of Veterinary Materia Medica, Therapeutics and Toxicology," Hoare's "Manual of Veterinary Therapeutics and Pharmacology," Cadiot-Almy's "Surgical Therapeutics of Domestic Animals," Hassloch's "Veterinary Materia Medica and Therapeutics," and Winslow's "Materia Medica and Therapeutics."

Theory and Practice.—Courtenay's "Practice of Veterinary Medicine," Cadiot's "Clinical Veterinary Medicine and Surgery," Friedberger & Froehner's "Veterinary Pathology," Baker's "Theory and Practice of Veterinary Medicine," Law's Veterinary Medicine," Hutyra & Marek's "Pathology and Therapeutics of Domestic Animals," and Hoare's "System of Veterinary Medicine."

Special Pathology, Bacteriology, and Parasitology.—Kitt's "Text-book of Comparative General Pathology," Dinwiddie's "Microbiology," Moore's "Pathology of Infectious Diseases," Moore's "Principles of

Microbiology," Kinsley's "Text-book of Veterinary Pathology," Burnett's "Clinical Pathology of the Blood of Domestic Animals," Buchanan's "Veterinary Bacteriology," Laveran's "Trypanosomes," Neuman's "Parasites and Parasitic Diseases," Herzog's "Disease Producing Microorganisms," Fish's "Examination of the Urine of Horse and Man," Kaupp's "Parasites and Parasitic Diseases," and Smythe's "Veterinary Parasitology."

Meat and Milk Inspection.—Peter's "Milk Inspection," Peter's "Meat Insp ection," Ostertag's "Meat Inspection," Walley's "Meat Inspection," Pearson's "Milk Hygiene," Edelmann-Mohler and Eichhorn's "Text-book of Meat Hygiene," and Ward's "Pure Milk."

Canine and Feline Practice.—Mill's "Canine Practice," French's "Surgical Diseases and Surgery of the Dog," Hill's "The Dog and Its Management and Diseases," Hobday's "Surgery of the Dog and Cat," and Glass' "Diseases of the Dog."

Lameness and Shoeing.—Zundel's "The Horse's Foot," Dollar's "Hand Book of Horse Shoeing," Liautard on "Lameness," Wyman on "Lameness," Hunting's "Art of Horse Shoeing," Roberge's "Foot of the Horse," Reek's on "Horse's Foot," and Adam's "Text-book of Horse Shoeing."

Obstetrics.—Fleming's "Veterinary Obstetrics," Dalrymple's "Veterinary Obstettics," Wyman-DeBruin's "Bovine Obstetrics," and "William's "Veterinary Obstetrics."

Miscellaneous Subjects.—Smith's "Hygiene," Huidekoper's "Age of Domestic Animals," Lupton on "Soundness," "Merillat's "Dentistry," Moussu and Dollar's "Diseases of Cattle, Sheep and Swine," Malkmus' "Clinical Diagnosis," Harger's "Exterior of the Horse," Hayes' "Points of the Horse," Henry's "Feeds and Feeding," Moore's "Tuberculosis," Pallin's "Lymphangitis," Salmon's "Diseases of Poultry," White's "Restraint of Animals," Reek's "Colics of the Horse," Woodruff's "Horse Feeding," Jowatt's "Blood Serum Therapy," Sharp's "Ophthalmology for Veterinarians," Hobday's "Cryptorchid Castration," Hunting on "Glanders," Lander's "Veterinary Toxicology," Scott's "Clinical Bacteriology," Besson-Hutchen's "Practical Bacteriology, Microbiology and Serum Therapy," etc.

As will be seen from the above list, nearly every branch pertaining to veterinary science is thoroughly covered, and it is gratifying to state that some of the most important ones, are either translated, or originally written by American veterinarians, who have done more than their quota to bring veterinary science to its present status. As a matter of fact, the most extensive works are of American authors, such works for instance as Prof. Law's "Veterinary Medicine," consisting of five volumes, and containing about 3300 pages in all; Merillat's "Surgery," of 3 volumes, containing 1700 pages in all; Hutyra & Marek's "Pathology and Therapeutics," consists of two vlumes, containing 2150 pages in all, the translation of which was edited by Drs. John R. Mohler, and Adolph Eichhorn; William's "Obstetrics," containing 1127 pages; Sisson's "Anatomy," containing 826 pages, and Ostertag's "Meat Inspection," which is translated by Dr. C. V. Wilcox, contains 884 pages. These, with the exception of Hoare's "Veterinary Medicine," which when complete will contain about 2600 pages, and Dollar's "Surgery," new edition, which contains 1131 pages (both of which are new English books), are the most extensive veterinary text-books printed in the English language.

The books mentioned above, fall far short of covering the entire list of veterinary publications issued during the past twenty-five years, but they are generally conceded to be the most important ones. I can safely state that more veterinary books have been published in the English language, since my time, i. e., 1890, than during the entire preceding period of the history of the veterinary profession.

ALEX. EGER,
Veterinary Publisher.

Chicago, Ill.

TRAUMATIC WOUNDS AND THEIR TREATMENT

A wound has been defined as "A solution of continuity of any of the tissues of the

body, involving also the skin or mucous membrane of the parts, caused by some external agent and not the result of disease." The character of a traumatism depends upon the manner in which it has been inflicted, the form of the offending body, and the anatomical structures involved.

An infected wound of the muscular structures, that is inflicted in such a manner as to allow of good drainage will require less care than one which does not permit of perfect drainage. When the tissues have been lacerated or torn by any blunt offending body, there results less hemorrhage than would occur in an incised wound, though such wounds are usually greatly contaminated. The structures involved are to be considered when we prognosticate the result of an injury.

A flesh wound, unless containing virulent pathogenic organisms, will respond to treatment much more readily than will the more dense structures, because of better tissue nutrition. In tendons, ligaments and fascia the reparative process is slow.

Where it is necessary to treat an injury as an open wound, after hemorrhage has been controlled and the wound rendered as nearly aseptic as possible, the frequent application of some mildly antiseptic agent serves to prevent further infection. Some agent which will not retard granulation either because of its irritating properties or by forming insoluble compounds with the wound exudate is indicated. Boric acid containing a small amount of chinosol or phenol serves very well. Where wounds are not moist enough to retain the dry dressing, it becomes necessary to moisten them with a mild antiseptic solution, using just enough of the solution to moisten the wound surface and no more. Immediately after having applied the solution the parts are covered with a protective dusting powder.

Where it is possible to do so, wounds should be kept bandaged. For a dressing material, I prefer absorbent cotton in generous quantities, retained in position by means of gauze bandages. Gauze makes a neater and less clumsy dressing and one that is better retained in position than are the heavier bandages. Further, gauze is not so unyielding and will allow of more even and uniform pressure. Uniform pressure limits the amount of the effusion and prevents its accumulation in any given place. The character of the dressing should be dry, aseptic or very mildly antiseptic. This will allow the absorption of a reasonable amount of wound discharge without causing irritation.

When regeneration of the break in the subcutaneous tissue has become complete, the daily application of a mildly antiseptic ointment gives good results. Organic vehicles are best, possibly because of the fact that they supply some local nutrition by being in part absorbed. Tallows or suets combined with phenol, turpentine or thujol have given good results when used sparingly and applied by mild friction. All excess should be wiped off to prevent adhesion of substances which would irritate the wound and incite exhuberant granulations. In addition to this, great care should be taken to keep the wound free from filth at all times.

Such treatment will, I believe, give better results than the frequent application of irritating antiseptics with no protection to the wound between such applications.

J. V. LACROIX, D. V. S.
Kansas City, Mo.

A DEATH FROM DISPLACEMENT OF THE LARGE COLON

About a week ago a six-year-old mare was brought to my hospital. According to the owner, the history of the case was as follows: During the past three weeks the mare had shown long intervals of uneasiness, manifested by more or less constant pawing and partial anorexia. She had remained in good flesh; was not gaunt; her bowel movement regular; feces soft and of small quantity. The mare had fallen on the pavement ten days previous to the appearance of the first of these symptoms.

Two veterinarians (men of considerable experience) were called separately, neither as far as I can determine gave a definite diagnosis; in fact, one of them seemed to

believe the owner was mistaken in thinking the animal was sick at all. No rectal examination was made in either case. Both prescribed a physic and general tonic.

As there was no improvement after several days, at the instigation of his neighbors, the owner drove the mare three miles to my hospital. He evidently had little faith in me because of my being a young man. He stated that he was absolutely sure the mare was going to die and equally as sure I would be unable to correctly diagnose the malady.

A general examination revealed respirations, pulse and temperature normal, visible mucous membranes normal. On rectal examination I discovered a portion of the large colon firmly impacted in the pelvic cavity, beneath the vagina and extending posteriorly as far as the posterior pelvic wall would allow.

The contained feces were very firm and attempted reposition by repulsion with the hand in the vagina was only partially successful, even with her hind parts considerably elevated. At cessation of the hand pressure the mare promptly strained and the parts were forced back to their former mal-position.

I had visions of various methods of attempting treatment and made my propositions and suggestions to the owner, but he was so certain the mare was going to die that he would listen to nothing that would incur the least item of expense. The mare if normal I would have considered worth $200.00.

Finally, as a last resort, I asked him if he would stable the mare in such a way as to keep her hind parts elevated, thinking perhaps the displaced viscera would fall enough of its own weight to allow more nearly normal bowel movement and in this way bring about normal position. This he would not promise to do nor did he do it.

One week later he informed me that the mare was dead. I immediately went out there to hold an autopsy for my own satisfaction, and found a dozen neighbors gathered who had previously given their innumerable variations of diagnosis, treatment and advice, and wished to learn if they were not each correct.

I opened the cadaver along the linea alba and on puncturing the peritoneum allowed two or three gallons of fecal colored fluid to escape. Before displacing any viscera the pubic bones were separated and the pelvic cavity laid open. Here I found the distal extremity of the right dorsal portion of the large colon and adjoining connection of the floating colon firmly embedded in the cavity lying against its posterior wall and so flexed at their junction as to allow passage for but a very small quantity of soft feces. The right dorsal portion was much distended with impacted feces. The floating colon practically empty. Where the two guts were compressed by the fold necrosis had occurred and allowed the rupture, which was the ultimate cause of death.

It seems to me that with an owner that would listen to reason this mare might possibly have been cured with proper treatment. At any rate, it would have been worth trying. Having previously had no similar case, I have no data to go by and wish to know what treatment would have probably been best.

W. F. Burleigh, D. V. M.
Oneida, N. Y.

Disinfectants and Their Standardization

(*Continued from page 8*)

ployed. The Anderson and McClintic method is a modification of the Rideal-Walker method to eliminate some of the variations which may be obtained in the use of that test.

In all such tests the great difficulty is a procedure by which the *exact value* of the disinfectants may be determined and a proper relative standard secured in the laboratory.

It must be borne in mind that such a test, no matter how painstakingly and elaborately worked out, is at the best but a laboratory test, and is only an index of the relative possibilities of the disinfectants under the varying conditions met with in practice.

However, it may be said safely that the Anderson-McClintic method gives us a

basis for successful testing of disinfectants and will at least enable us to standardize their action toward the typhoid organism relative to the action of phenol under the same conditions.

In using the Anderson-McClintic method it is most essential that the exact recommendations of the authors be carried out in the minutest detail. Lack of attention to the different factors concerned in the examinations of disinfectants is responsible for most of the discrepancies in results obtained by different workers with the same disinfectant. Close attention to the details of the method used is the only way in which uniform results can be secured.

The factors which bring about the greatest variance in results obtained, and which must be considered of the most importance in the conduct of the test are, (1) the organism used, (2) temperature of the experiment, (3) amount of culture, (4) amount of disinfectant, and (5) the media used in subculture, (6) standardized solution of phenol.

The coefficient obtained by different species and different strains of same species may vary greatly, so it is essential that one species be adopted and that the cultivation of the strain employed be as nearly standardized as possible. For this reason the Hopkins strain of B-typhosis is employed. It is cultivated on standard extract broth made from Liebig's extract of beef in accordance with the methods adopted by the American Public Health Association for water analysis. It is important that the reaction of the medium be just 11.5. One loopful of 4-millimeter platinum loop of the culture is carried over every twenty-four hours on three successive days. The culture is filtered through sterile filter paper and brought to a temperature of 20° C. in a water bath before being added to the disinfectant.

One-tenth of a cubic centimeter of the culture is used, added to 5 Cc. of the disinfectant dilution at a temperature of 20° Cc. Measure the amount of culture with a pipette graduated to 1-10 Cc.

When the proper dilutions of the disinfectant to be tested and the phenol controls have been made and placed in their respective test tubes, all is placed in a water bath so that the solutions may be brought to a temperature of 20° Cc. A standard solution of pure phenol is made and standardized by U. S. P. method to contain a five percent solution by weight. Dilutions are made fresh from this each day. When everything is ready 1-10 Cc. of the culture is added by the pipette to each of the dilutions in the seed tubes.

The solutions are planted from the seed tubes into the culture tubes every two and one-half minutes up to fifteen minutes, and for this a 4-millimeter platinum loop United States standard, 23-gauge wire is used.

In adding the culture to the dilution, the best method is to tip the test tube at an angle of forty-five degrees and lightly touch the pipette against the side of the tube below the surface line and then shake gently. The broth tubes are placed in the incubator at 37° C. for forty-eight hours.

The mean between the strength and time coefficients is used for determining the coefficient. To determine the coefficient, the figure representing the degree of dilution of the weakest strength of the disinfectant that kills within two and one-half minutes is divided by the figure representing the degree of dilution of the weakest strength of the phenol control that kills within the same time. The same is done for the weakest strength that kills in fifteen minutes. The mean of the two is the coefficient.

As has been stated before, the coefficient simply represents the germicidal power of the disinfectant tested, relative to the power of phenol on the same organisms under the same conditions, and should be accepted only as such.

However, it is the best which we have at present, and a great deal of thanks are due to Rideal-Walker and to Anderson and McClintic for carrying us this far in obtaining a procedure by which we may begin to standardize disinfectants.

STILL AFTER HIM

A fine of $10 was imposed on Dr. David Roberts Veterinary Co., of Waukesha, Wisconsin, for shipment into Chicago of an article labeled "Dr. David Roberts' Disinfectall For Dipping Livestock. To Prevent Disease and Kill Parasites." Examination of the article in the Department of Agriculture showed that the packages contained less than one gallon of the article, as stated on the label, and the claims that the product was invaluable for destroying mange and all parasites of livestock were not true, as there are certain forms of mange and certain parasites of livestock that would not be destroyed by this insecticide.—*Bureau of Imformation, U. S. Dept. Agr.*

COMMENTS ON THE FIELD OF VETERINARY SCIENCE

We hear comments quite frequently in regard to the field of veterinary medicine being jeopardized, until it would appear to one who is not conversant with conditions as they are and who does not take the time to analyze what the future probably holds in store for the embryo veterinarian, that the coming decade would see the usefulness of the veterinarian beginning to wane.

Dr. A. H. Baker in an article a short time ago touched upon or rather forecast the veterinary field, cleverly describing the "Optimist as seeing the doughnut and the pessimist seeing the hole." We are not going to crawl into the hole, but on the contrary educate ourselves along lines which conditions will demand; we will obey the handwriting on the wall and pay more attention to hygiene, sanitation, policing and to meat and milk inspection.

Many are engaged in this field at present, but to my mind, like the immense mining fields of Alaska, it has been hardly touched; not referring to knowledge for the newer graduates are being schooled along these lines and should be prepared to fill positions with credit; but referring to the field which is being prepared and cultivated daily in educating the public to the growing need of educated men to foresee and forestall certain conditions which might bring about disease in the human family.

Who, may I ask, is better fitted or better prepared than the veterinarian, by virtue of his education relative to disease among lower animals, etiology, bacteriology, pathology, sanitation, quarantine, etc., being thoroughly grounded in his school days?

Does it not stand to reason that such a one is the ideal man to be associated with health boards to advise and direct when his particular branch comes into active discussion.

I well remember when I came to Seattle, there was no city veterinarian; today Seattle employs three on salaries. The time will surely come when all cities having a population of five thousand or over will demand that local conditions be under the direct supervision of an educated man.

One whose education does not include the pathology of domestic animals is not the logical man for such a position and I contend that no man can compare as a sanitarian or hygienist with the veterinarian. It appears to me that this is one of the very pillars upon which sanitation rests.

Think of a local butcher shop with one horse and wagon hauling away the refuse from the slaughter pen, and this same wagon used for delivery purposes; the butcher, being of an economical turn of mind, keeps a few hogs, which run around the slaughter pen and feed largely on offal tubercular, probably, as no inspection is practiced—and these in turn killed and delivered to your family. These things will be changed; the veterinarian practicing in the rural communities should have supervision of a county say with his deputies, if necessary, and the milk supply and meat supply with the farms from which they are derived under his jurisdiction.

Where a few veterinarians are at this time pioneers in the field, the future with its increased population and enlarged demands will employ many more veterinarians than we would at the present time believe possible.

Private concerns are today employing veterinarians on salaries—the large milk companies, for instance. There were no

such avenues open to the practitioner of veterinary medicine a few years ago.

The country practitioner enjoys generally speaking as busy a practice as ever, and while the city practitioner in some cities has his field of general practice limited, to my mind the field, considered from all angles, without bias or prejudice, tends to prove that there is and will continue to be as much grist to grind as has been in the past, and a prospective growing field.

J. T. SEELY, M. D. C.

Seattle, Wash.

PECULIAR BRAIN DISORDERS OF THE COW

I was called at noon one day last month to see a big red shorthorn cow that was in good condition as to flesh. She was stabled in a good warm barn, loose in a box ten by sixteen feet. The animal was wet with sweat, something that not everyone has seen, although cattle will sweat very profusely after sundown on a sultry day. This is seen mostly in work cattle, which are worked late. But to return to the case under consideration.

This cow was sweating profusely, very unsteady on her feet, in moving she would turn to the right at all times if left to herself, but she could be made to turn to the left. Her head thrown around to the right side much of the time, and she would lick the right foreleg from the knee to the elbow. She was very nervous; when not licking her leg she would grind her teeth, so that you could hear her readily outside of the barn. Her gait was such that you would think at every move she would topple over. It was not the staggery gait one gets in milk fever, but more of the whole body seemed involved.

Not having seen anything just like it in some time, and being quite a ways from town, I came to this conclusion: Here, in this case, I had some form of nervous trouble, reflex from an irritation of the stomach. In former cases like this, where oil, salts, etc., had been given in conjunction with bromides, my results were far from good, so in this case I decided that instead of bromide of potassium to quiet things down, I would just reverse the line of treatment.

I prescribed one-grain doses of strychnine every hour for four hours, then every three hours. I also gave one and one-half pounds of magnesium sulphate, and wound up the treatment by inflating the udder with air. We then went out and ate a lunch and were gone from the barn one hour. On returning, the cow was up and standing still (instead of nervously moving about as before), had stopped licking the leg and looked much better in every way. The next morning the owner reported that the cow was apparently as well as ever, but the salts had not induced catharsis. I advised the owner to let the cow alone, but to give her at least three doses of strychnine during the day. The report four days later was that she had been turned out with the others on the second day and was as well as ever.

Another very similar case was seen shortly afterwards; this, a Jersey cow, due to be fresh in about two weeks. On my arrival at the farm I was confronted with the same conditions described in the preceding case. The animal was very shaky, could scarcely stand up, her head around to side, licking her side and foreleg and when not so occupied grinding her teeth. In this case there was some difference in the history in that this cow had been shipped from the state of Virginia a week before and the owner was more than sure she had been hurt in shipping, and that the fetus was dead. He, as many others, had seen a number of these same cases, and while not from shipping the calves were in some way shut off from nutrition and died before birth.

Now to convince some of these dairymen that things other than they think could be wrong is sometimes quite a task. His idea was, that to save the animal the fetus would have to be removed immediately by force. Now this, as all veterinarians know, is all right in theory, but in practice is something quite different. So, to keep the owner in good spirits I told him that in order for the animal to go through such an ordeal she would first have to receive preparatory treatment so that she could

stand the operation, and that in a couple of days I thought she would be better able to stand the same.

In this case one pound of salts was given and one grain of strychnine every two hours for four doses, then every four hours. The udder was inflated with air. Twenty-four hours later the owner reported that the cow was eating well and apparently was as well as any cow, and he thought so long as she looked so bright it would not be necessary to operate on her. So the operation was put off for the next ten days, when the cow gave birth to a nice living calf, healthy and in good condition.

I have not been able to convince the owner that the trouble was gastric rather than uterine. He is still of the opinion that she was hurt and that between the kidneys and the strain on the uterus these conditions were brought on. Suffice it to say, she is well.

I have employed this treatment for the same ailment a number of times lately and always with success. Previously I have used the same medication without inflation of the udder with entire failure; and, as mentioned in the foregoing, sedative treatment has always failed me in this condition.

D. O. KNISELY.

Topeka, Kans.

ENEMATA IN VETERINARY PRACTICE

In aiding nature to overcome disease, several things are essential, chief among which are these two: the providing of the animal body with the materials necessary to rebuild destroyed tissues, and to aid it in the breaking down and excretion of the products of disease.

In the latter endeavor I believe enemata to be of paramount importance, while in the former their aid is often of greatest value.

Winslow enumerates thirteen indications for fluid injections into the rectum, and while I have not had occasion to practice each one as indicated, I have found that in the run of every-day practice my injection pump and hose have been of much use.

In making way (so to speak) for the drastic purgatives so generally used in some forms of colic, impaction, etc., I find that washing out the lower bowels saves the animal a great deal of pain by softening up the bowel content so that it may be easily ejected, and aids the purgative in thoroughness of action. In pneumonia*, pregnancy and other conditions where purgatives are contraindicated, I have found that an enema is a useful substitute in assisting the bowel excretions.

For the above purposes I find that a small amount of cresol compound solution (liquor cresolis compositus) not only gives the desired "soapy" consistency to the water, but also acts as a check on the fermentation of the bowel content. Lysol or creolin makes an agreeable substitute, while castile or tar soap is cheaper and oftentimes as serviceable.

A small amount of salt (normal saline solution) added to the water prevents the weakening effect if numerous injections are necessary, while of course all practitioners know of the value of saline injections following severe hemorrhage.

The temperature of the water to be injected depends largely on the condition of the patient, as well as the objects for which the injection is being given. Cold water injected into the bowels is generally a practical, quick and safe way to reduce fever; in atonic conditions of the bowels lukewarm or moderately cold water is best, in weakened or exhausted conditions water as hot as can be borne by the hand without discomfort is my preference.

Nor is the giving of clysters confined to aqueous solutions of desired substances; food, medicine, oils, etc., are generally easily given in this manner. In giving medicine, high injections of small amounts are more easily retained, care of course being taken that such substances are not irritating to the mucous membranes. The dose for rectal injections is usually twice the oral dose.

In overcoming diarrhea, washing out the irritating bowel contents, followed if necessary by astringent or anesthetic solutions, is most useful. Boiled starch and opium

*One has to induce free catharsis in cases of pneumonia but a single time to be convinced of its great utility in the treatment of this disease.—Ed.

combined is an admirable agent in this respect.

Oxyurides are easily killed by enemata.

The stimulating of peristalsis (cold water), relief of spasms of the bladder (hot water), and many other conditions can be largely assisted by rectal injections.

While an injection pump and hose is useful, they are by no means necessary, as a few feet of garden or spray hose, in one end of which a funnel is placed, answers the purpose nicely. Indeed, the resourceful practitioner can oftentimes adopt unique methods successfully when placed in a position where it becomes necessary so to do.

The foregoing is by no means exhaustive but is meant to be merely suggestive of the many ways in which this simple therapeutic measure may serve one, but I must not fail to mention the danger arising from the careless or rough use or of unclean or harsh hose; proctitis is too often the sequel of such lack of skill.

CLIFF. ACKLEY, D. V. M.

Kelso, Wash.

HEMORRHAGE AFTER CASTRATION

On September 10th I castrated two well bred colts, about 16 months old. It was 11.30 o'clock when first colt was brought out, and I had both done at 11.50 a. m. They were both cast, and the écraseur was used. I have been using the same écraseur for past four years, and find it very successful.

Both colts were apparently all right, and when they were let out in a field, started to graze. I then saw a couple of lame horses, and had lunch with my client, after which we passed through a field where the colts were. Neither of them showed any sign of having bled, their legs were quite dry.

When we arrived at my second client's place, a telegram was awaiting me requesting me to examine a horse that evening, twelve miles further on, so my second client motored me there.

On my return at 7:30 p. m. the owner told me he had just been putting colts in for the night, and that the last one operated on was bleeding. I went to the stable and found a thin stream of blood running from one wound. After watching for half an hour I decided to cast the horse and ligature the artery. This was done and a lantern got, and when colt was on its back I proceeded to expose the artery. I removed a quantity of coagulated blood out of cavity, got artery and vein between my two fingers, but to my surprise they were not bleeding. To make doubly sure I ligatured with silk; I then looked to see if any artery in scrotum had been cut, but found all intact. Let colt up, and if anything, he bled faster than before. I put cold sacks across his loins, and thought for a time this was going to have the desired effect, as instead of running, the blood only dropped quickly from the wound. However, in a few minutes it started to flow in a stream again. I then left for home; the colt was eating a mash, and I advised a sack to be kept on all night, and if bleeding continued at daybreak to send for me.

At 6:30 a. m. my client motored for me; we found colt was bleeding just the same. I turned him out in the yard and the bleeding stopped. We watched him for half an hour, and only one drop came during that time. He was very weak, and his pulse very weak—I had noticed the night before how strong his pulse was. We went to breakfast, and sent the groom with a bran mash and told him to tell me if the patient started to bleed.

After an hour's delay I again went to see the colt. I found him bleeding as fast as ever, shivering about the flanks, and very seedy-looking. I gave an enema of saline solution. Then I decided to cast him, and not wishing to lose any time, the three of us accomplished it, and propped him on his back. I got artery and vein, and dried up all the blood around them with cotton wool. I noticed the blood welling up to me, so came to the conclusion that the wall of spermatic artery had ruptured high up in inguinal canal.

I enlarged the wound in scrotum so as to get a better view, but could not find where the blood was coming from. As a last resource I saturated a plug of cotton wool with Friar's balsam and pushed it up as far as possible with my fingers; then put three

more plugs of cotton wool in, stitched the wound in scrotum, and let him up.

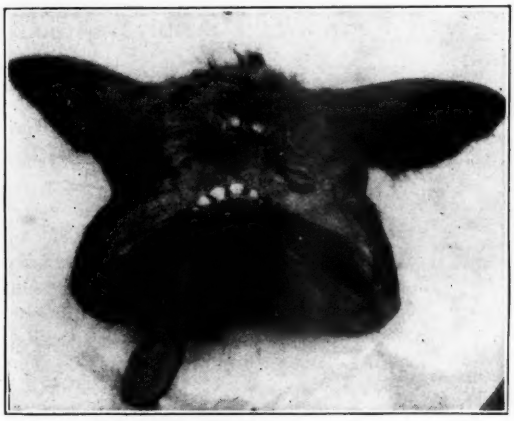
I prescribed powders containing iron. Next morning I got a message saying "colt doing well, no blood coming."

On the 13th I removed stitches and plugs, and colt recovered rapidly. I may say that the colt was not bleeding at 5 p. m. on day of operation.

I would like to know if anyone has had a similar case, or if they could suggest what caused the bleeding? The colt was a particularly quiet one during the operation, and I am sure I gave the artery no "chuck" when removing testicle.—F. S. RINGWOOD, Templeshannon, Enniscorthy, England, in *The Veterinary Record.*

GARMAN'S MONSTROSITY

Enclosed find picture of a calf head. I was called to deliver this calf and after some troublesome labor I delivered the monster.



Head of Calf Delivered by Dr. Garman

It is a very straight bifurcation of the upper jaw with the lower jaw grown in a semi-circle causing the bifurcation of the upper jaw. The teeth of the lower jaw are, as the illustration shows, away up between the eyes of the calf.

The entire carcass was very large. The calf was born dead. The owner said it was alive in the morning and that labor started at about 5 p. m. I was called at 8 p. m.

I have never seen or heard of such a case and several colleagues say it is a new one to them. I would like to know if anyone has found anything similar to this.

R. A. GARMAN.

Martinsburg, Pa.

"PARTURIENT" PARESIS REMOTE FROM THE PARTURIENT PERIOD

In answer to your question on page 634 of the November issue, I will say that the past summer I was called to Mackinac Island to see a cow that was very sick.

On my arrival I was informed that the cow had been in heat the day before, and was eating well, and apparently in every way in a healthy condition.

I found her lying down flat on her side, with an increased pulse and rapid breathing. Her nose was very dry, the eyes glassy, and I could touch eyeball and she would not wink. I was told that the night before she had been lying down with her head around to her side as though her neck was broken. After looking her over carefully I pronounced it parturient paresis and gave her the air treatment. She was up on her feet again and eating in five hours.

This cow was shipped to the Island from Chicago after being tuberculin tested, and had not calved for at least three months previous to the time I treated her.

Now what I would like to have someone explain is that if this cow did not have parturient paresis, what was the matter with her.

O. H. GEBHARDT.

Cheboygan, Mich.

Intelligent Therapeutics

(*Continued from page 10*)

4. Don't depend upon the ammonium salts and their preparations alone, as heart and respiratory stimulants; their action is too transient. Follow up with agents more lasting.

5. Don't use strong, irritating, tissue-destroying disinfectants, they retard healing, weaken tissue cells and favor the production of pus.

6. Don't use anodynes before administering eserine or arecoline, as the former inhibit the action of the latter.

7. Don't use barium chloride intravenously, the shock it causes is too dangerous. Use it by the mouth, it is a valuable purgative.

8. Don't forget that belladonna in small doses stimulates the heart, respiration, and intestinal peristalsis, but that large doses causes general depression and stupor.

9. Don't forget that the continued use of boric acid, on extensive surfaces, causes poisoning with subsequent emaciation, loss of appetite, etc.

10. Don't forget the bromides with gelsemium in cerebral disturbances.

11. Don't overlook the value of camphor as a heart and respiratory stimulant as well as an expectorant. It is also valuable as an intestinal antiseptic, anodyne and antispasmodic.

12. Don't forget that buchu is only a very feeble diuretic; it is rather an agent to gently stimulate and disinfect the mucous membrane of the kidney and bladder in subacute and chronic conditions.

13. Don't forget to combine carminatives with drastic purges; they overcome griping, stimulate peristalsis, and stimulate the expulsion of gases.

14. Don't underestimate the value of chloral hydrate to produce partial or complete anesthesia.

15. Don't forget that creosote is a valuable agent to destroy intestinal worms.

16. Don't look for better deodorizers than Labarraque's Solution, sodium perborate, or potassium permanganate. The stain of the latter can be removed instantaneously by the use of hydrogen peroxide, to which a small amount of acetic acid has been added.

17. Don't fail to remember that digitalis does not produce results until about two hours after administration, that it should not be repeated too often, and that a safe plan is to limit the amount given to the horse, in twenty-four hours, to two fluid drams of the fluid extract.

18. Don't forget that quinine and urea hydrochloride in one-half to one percent solutions is the ideal local anesthetic; owing to its prolonged action it allays postoperative pain.

19. Don't forget to reinforce sutures with a strong adhesive plaster, it will save you lots of grief.

20. Don't expect results from magnesium sulphate in cases where the animal has been deprived of water for some time unless the salt be copiously diluted with water. Give at least one and one-half gallons of water with it.

21. Don't overlook the value of flexible iodoform collodion to protect incised wounds after suturing.

22. Don't imagine that we can obtain a more satisfactory skin disinfectant and detergent than Linimentum Saponis Mollis.

23. Don't neglect to remember that Lugol's Solution is a valuable agent to disinfect wounds as well as a valuable renal depressant.

24. Don't use irritating iron salts internally when the digestive apparatus is impaired; select the phosphate or carbonate.

25. Don't depend too much on the action of somnifacients; their use in the lower animal is not satisfactory.

26. Don't give opiates except for one condition, that is superpurgation. If you desire to allay intestinal pain or spasms, be sure that the intestinal canal is free from offending material, then use atropine and morphine subcutaneously.

27. Don't overlook the value of naphthalin, in powder or ointment form, to keep flies from wounds.

28. Don't labor under the impression that nitroglycerin is a heart stimulant, it is simply a powerful vaso-dilator and as such lowers blood tension and relieves the work of the heart. A valuable agent in acute pulmonary congestion.

29. Don't look for a better heart, respiratory and intestinal stimulant than strychnine.

30. Don't always think that the spasms and convulsions following a moderate dose of eserine are toxic in character, rather suspect an impaction, or the presence of calabarine in the eserine.

31. Don't use salicylic acid and sodium salicylate indiscriminately; as an antiferment use the acid, for the constitutional effect use the salt.

32. Don't use urotropin as an urinary disinfectant in herbivorous animals, it is of no value. It requires the presence of an acid to break it up and liberate the formaldehyde. It is very satisfactory in combination with sodium benzoate or sodium salicylate.

33. AND REMEMBER that Dr. J. B. Murphy, the famous Chicago surgeon, has recently expressed his conviction that the great future within the province of healing lies not in surgery, but in internal medication. The motto is: STUDY YOUR MEDICINE.

A Farm Water Supply Injurious to Horses, Etc.

(*Continued from page 12*)

ounces of saline cathartics each day. Of the diuretic salt a horse would be getting twelve grains. Combined with the well-known action of the sodium nitrate on the kidneys, we have the added effect of the cathartic salts. We feel justified in concluding that we have here an explanation of the primary symptoms exhibited by the horses, viz., thirst, increased appetite, looseness of the bowels, diuresis. The secondary manifestations which can be covered by the general expression, lack of vigor, undoubtedly depends upon the primary condition mentioned above.

Our conclusions are not based upon the theoretical deductions from the chemical analysis alone, but are strengthened by the fact that when affected animals are removed to other farms in the vicinity and receive their water supply from a different source, even though the feed remains the same, rapid recovery results, while the debilitating effects of the water in question are again manifested when the recovered animals are returned.

If we wish to place the results of the analyses recorded herein in contrast with analyses made of water by others, we can use the figures supplied by Thresh. However, we believe that the contrast furnished by the two samples from the same locality is of more worth than anything that any other array of figures could produce.

Comparing the results of the analysis of twenty-four samples of shallow well waters by Thresh with those obtained for sample A, the suspected sample, we find in only four cases an excess of total inorganic salts, and in these cases in only one instance is there a greater amount of the salts which we believe are responsible for the injurious properties of sample A. One sample contains more $MgSO_4$; not another sample contains even one-third as much $MgSO_4$; only three contain any Na_2SO_4 at all, and in these cases less than one-fourth the amount. More than half the samples contain above the amount in sample A of NaCl and nearly all the samples contain more $NaNO_3$. Therefore, we feel justified in at least suspecting the high content of $MgSO_4$ and Na_2SO_4.

Concerning the possibilities of removing the conditions, we quote from the suggestions of the chemists:

"The total solids might be altered by treating the water. The physiological nature could not be much changed, however, because of the formation of more sodium sulphate. The best thing to do in a case like this one is to dig another well, preferably a deep-drilled one, and have the water analyzed to find out if it contains any undesirable qualities."

What the Example of the Canadian Army Veterinary Service Can Teach Us

(*Continued from page 19*)

nary organization in our army be formed, he will have all the work now given to the Canadian army veterinarian, and, in addition, there will be other requirements demanding in him qualifications uncalled for in Canada. The varieties in the climate and geographic conditions in the United States require that our army veterinarians should have a wider familiarity with more local diseases and their causation than the Canadians. Besides, our army animals are to be under their care and treatment in the Philippines, Hawaii, Porto Rico and Panama, so that a knowledge of tropical diseases is mandatory. Sanitary medicine, or preventive medicine, is with us a strong point, and our army veterinarians must be fitted to inspect in case of war cattle on foot for diseases or their carcasses the evening before the issue of the meat, as well as to supervise the preparation of meats for army use in the industrial centers at all times. With the concentration of the

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O. C. No. 2, Sect. C. A. V. C.

troops in large garrisons, the army veterinarian, under War Department Regulations, must inspect the milk for these regimental and brigade posts and its source if possible when it is purchased locally. He must be prepared to teach officers not belonging to his profession in mounted service schools and schools of the line, such as at Forts Riley and Leavenworth, or to instruct officers by classes in hippology in any post. He must be so well informed on conformation of the army horse and on soundness as to be responsible when purchases of horses are made. In equestration he must be enough of an adept to take the riding tests the same as all officers. The talents and energies of our army vet-

erinarians will be tried to the utmost in case of war, because, should they become commissioned officers, they would not only be responsible for *the public animals of the regular military establishment,* but their responsibilities would be extended to cover *horses of militia regiments* sworn into the federal service. In that event their responsibilities would be doubled.

The existence and success of the Canadian Army Veterinary Corps argues for the establishment of a veterinary organization in the United States army. There is an aching void which must be filled; a chaos which needs immediate attention. The question is, is the American veterinarian to be beaten by the Canadian veterinarian. What he has done is a challenge to us and we should accept the challenge. The answer is to be seen in the way we work for the Hay bill, H. R. 4541, now before Congress, this winter and the coming spring. If the success of the Canadian Army Veterinary Corps teaches us anything it teaches us this—that the American army veterinarian must be made a commissioned officer if he is to match even or excel his Canadian brother.

Observations on the Clinical Diagnosis of Glanders

(Continued from page 22)

the animals have high temperatures, as in the cases reported by Fröhner.

An important fact in its favor, so far as present reports are available, is that it does not condemn horses that are not affected with glanders. In addition, it is an easy matter to test the solution on healthy animals or to accept the nonreactors as checks.

The clinician who is often in trouble when he meets glanders suspects has, therefore, at his command a diagnostic method at once reasonably correct (90 to 94 percent) and simple, and independent of the laboratory methods, something that will permit a vigorous fight along rational lines against one of our most dangerous diseases. It is of the utmost importance to be able to verify the physical examinations at once, and identify such a high percent of occult cases without having to refer to distant laboratories.

Recently a disease resembling glanders has been reported in the Island of Catanduanes, and the authorities of the Province of Albay together with local horse owners have applied to the Bureau of Agriculture for assistance. The writer is at present engaged in field work on that island designed to control the disease. A comparison will be made of the accuracy of the various means for recognizing glanders, such as clinical diagnosis, the subcutaneous inoculation of mallein, the agglutination methods, the complement-fixation reaction, and the ophthalmo reaction. All will be supplemented wherever possible by postmortem examination, the results of which will set the standard with which to compare the accuracy of the various tests.

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Abdominal Wounds of Animals

(Continued from page 24)

badly mutilated a sufficient amount of tissue to allow a hernia of the floating colon. Separation of muscular layers had taken place to an extent sufficient to permit of the incarceration of about twenty inches of intestine.

The writer was called about four hours after the accident occurred. At that time there existed in the left flank just anterior to and below the anterior iliac spine an enlargement ten or twelve inches in diameter, which was edematous in its periphery. Manipulation of the mass caused pain to the subject. By rectal examination it was possible to outline the irregular borders of this abdominal rent. The animal was very restless and it was decided that immediate

surgical intervention was the only recourse.

With assistance the subject was cast and anaesthetized, the field prepared, and by means of a free incision the strangulated loop of bowel was exposed and replaced. The wound was prepared and the various tissue layers were sutured separately. The mule was allowed the freedom of a small blue grass pasture, and beyond some suppuration which later necessitated drainage, a complete and uneventful recovery resulted.

Laceration Without Eventration

Laceration of some part of the abdominal wall without eventration is of very common occurrence and is caused in numerous ways. Because of the fact that fibers of the several muscular layers of the abdominal wall are disposed in various directions, large wounds occur without complete perforation. This is particularly true when the offending implement is not possessed of a keen edge or a sharp point. Horses are kicked by others that are wearing sharp calked shoes, receiving extensive lacerations, but it is very unusual for the victims of this mode of injury to suffer eventration at the time of accident. In jumping over and upon fences, lacerations of the abdominal wall occur; but unless the animal strikes an upright body capable of penetrating the abdomen, extensive lacerations usually take place without immediate eventration.

Lacerations of the abdominal wall are characterized by visible solution of continuity, fragmentary protrusion of margins, and more or less hemorrhage. Because of the facility with which separation of tissue layers takes place, sacculations are to be found under the margins of the wound; these extend in various directions, and where gravitation or pressure does not interfere, they are filled with blood.

Where such wounds are not too deep, and conditions make impracticable other and more elaborate treatment, they may be cared for by trimming away all macerated tissue; controlling hemorrhage, and further dressing them as open wounds.

Where such lacerations are deep and involve enough tissue that eventration threatens, coaptation of the wound margins in some manner is necessary.

In the handling of such cases in large animals, the first problem which contronts the operator is that of restraint. Certain it is that the subject must be confined, and unless the wound is high up on the side, a recumbent position is necessary. As a precautionary measure it is well to apply a temporary bandage to protect and support the parts until the animal is placed in readiness. If much suturing is to be done, complete anesthesia is imperative. Local anesthesia would suffice were it not that the subject usually resists confinement rather than the pain inflicted by the process of suturing.

Since the treatment of such wounds constitutes emergency surgery, there is no time for the preparation of the subject, and one must count on an occasional loss from anesthesia, delirium, or shock.

Careful attention must be given to cleansing the skin bordering the wound; a liberal area should be shaved; all macerated tissue removed and the wound thoroughly cleansed by mopping with gauze or cotton moistened with a very mild antiseptic solution, or with sterile water. After hemorrhage has been controlled, all parts should be moistened with tincture of iodine. Particularly is this essential if the wound has taken place several hours prior to its being treated, or if it has contained much dirt or filth.

Approximation of the wound margins, with the exception of the skin, may be done by means of continuous sutures of chromic gut. The several layers of tissue comprising the abdominal wall should be sutured separately. The skin should be sutured with a heavy material either of silk or linen. Mattress sutures serve very well. Reinforcing sutures in the skin and subcutem are useful in some cases. This method of suturing is applicable in all cases where coaptation is attempted. Some suppuration occurs in the majority of cases and drainage should be provided for by means of a tube or by inserting at some pendant part of the wound a suture that is readily removed. After care consists in keeping the parts clean, restricting exercise, and plenty of time should be allowed that complete repair may take place, else

hernia is likely to occur even three or four months after the wound has completely healed. The parts may be supported by means of a heavy bandage material during the process of treatment, but it is doubtful if this is of real service if the wound has been properly sutured. In large animals wounds so treated are completely united within thirty days unless swelling persists and considerable necrosis results.

A lacerated wound of the abdominal wall in a mule, the result of a kick with a sharp calked shoe, was treated at the Kansas City Veterinary College in January, 1911.

The injury was located in the right lower abdominal region about eight inches from the median line and twelve inches anterior to the pubic brim. All of the structures except the peritoneum were lacerated. The wound extended almost at a right angle from the spinal axis, and was about five inches in length. Much dirt and filth had been carried into the depths of the wound, and there was extensive maceration of tissue.

The animal was placed upon an operating table and the wound was treated as herein outlined. Union of parts had taken place in about three weeks, and the patient was then dismissed from the hospital. She was put to heavy work at a grading camp and a hernia resulted. However, this did not interfere with her usefulness, but was the direct result of an insufficient length of time for complete repair to have taken place before putting the animal in service.

Wounds With Eventration and Without Visceral Perforation

Wounds with eventration and without visceral perforation occur in all animals, the result of direct injuries of various kinds. The agent inflicting such injuries is not sharp enough to perforate viscera immediately upon contracting them, even though driven with great force. This type of wound occurs in horses where they are gored by bovines, where they become impaled upon upright posts or implements of various kinds. The writer has observed fatal eventration in the horse where a rent at least eight inches in length was inflicted by a Jersey cow's horn. Where much of the intestine protrudes it is likely to become injured beyond repair, unless it is given immediate protection in some manner until reposition is effected. Even though successful reposition of the intestine is effected, there is danger of peritonitis and considerable shock always attends injuries of this kind. Where such wounds involve the floor of the abdomen there is likelihood of hernia resulting unless it is possible to securely approximate the wound margins.

Treatment consists in, first, protection of the exposed viscera and appropriate confinement of the subject. After thoroughly cleansing the visceral organs reposition is attempted. In the large animals, if there is much struggling or straining, complete narcosis is needed. Reinforcement and protection of the wound with dressings and bandages is helpful in small animals, and may be of some advantage in the large animals. However, where such wounds are kept covered, they remain moist and are prone to suppurate unless frequently redressed.

Penetrant Wounds With Visceral Perforations

Visceral perforation occurs occasionally in any of the domestic animals and is the result of gunshot wounds, thrusts with sharp implements of any sort, or where animals become impaled upon sharp projecting bodies. In the smaller animals tooth wounds sometimes penetrate the intestine.

Where the perforation is large in animals that resist well, manipulation of the peritoneum, it is possible to close the intestinal wound by means of bowel anastomosis or by approximation of its margins with sutures. Spontaneous marginal adhesion of serous membranes with the production of fecal fistulæ is not of uncommon occurrence.

Where small puncture wounds involve the bowel in numerous places, allowing the escape of intestinal contents into the peritoneal cavity, there is no effectual means of intervention except such as occasions

laparotomy; therefore the repair of this form of injury is often impracticable.

Transmission of Contagion by Immunization

(*Continued from page 26*)

by which tuberculous men pass over the streets daily to the hospital for treatment and then return to their homes or those of their friends, to public gatherings of all kinds, to public cars, boats and conveyances, and to their places of occupation. Many sanitaria refuse to accept any but incipient cases, leaving the advanced and more dangerous ones to do their worst in their homes, factories and stores; and by and by they send back their partially recovered cases to crowd in with the advanced ones and contract a new access of infection. The seclusion of immunized livestock is no better. These are often operated on to protect themselves while passing through channels of trade, and are then shipped without giving a thought to the possible infection of cars, yards, loading banks, markets, the herds to which they are taken, etc., etc."

"Perhaps nothing is more striking than the management of rabies. The bitten person goes to a Pasteur institute, often a long journey in a Pullman or sleeping car. Then he goes daily (once or twice) to the institute to receive his injection, and at once passes out on the street and goes to his hotel, room, or elsewhere. After three weeks of this, with 28 visits to the institute, he is sent back home, well charged with the germs of 28 injections. With very few exceptions this saves the man, but has it done anything toward spreading the virus of rabies? In Paris it has been applied, not to man only, but to dogs as well, and, up to date, Paris has never lacked a full supply of rabid dogs and bitten men. In New York, for over 20 years after 1868, I never saw a case of rabies in the rural districts of the state. Now rarely a week passes without the report of an outbreak, and reports come from virtually every part of the commonwealth. In contrast with this, Australia, Tasmania and New Zealand, hich impose a three months' quarantine and practically admit no dogs, have, I believe, never had a case of rabies. England, protected from France by the narrow Dover Straits and a similar quarantine, stamped it out by muzzling and disinfection."

"This has assumed the escape of the microbe from the system of the bearer, and the facts given are only explicable on that basis. The following considerations further strengthen this conclusion, though to state them is virtually a work of supererogation.

"1. *The immune condition is rather an invulnerability of the subject than the destruction of the microbe.*"

"2. The paraded claim of imprisonment of the germ by encapsulation is a poor and insubstantial theory to trust to."

"3. Most germs enter the system through an intact mucosa; it is illogical to say that they cannot escape through the same."

"4. With an open sore, a superficial inflammation or ulcer, a neoplasm or other active disease-process, both entrance and exit, furnish manifestly an even simpler problem."

"5. From an active deep-seated lesion the escape of the microbe through the soft tissues must be a simple process, the organism passing into the lymph vessels of the tissue itself, thence into the blood, and finally out of the body through the soft, vascular tissue of a mucosa or secreting gland."

It may now be permitted to quote shortly from "The Farmers' Veterinary Adviser (1887) partly to show that this is no *new appeal*, and partly to place the subject in a clearer light or to add facts to those presented above:

Page 63: "The truth is that the Pasteurian inoculation should be surrounded by greater safeguards than even its author has yet appreciated the need of. While the great majority of those bitten by rabid animals may, by its adoption, be protected against rabies, they cannot safely be set at large immediately after the treatment, as practiced by Pasteur, but should be quarantined until time shall have assured us of the destruction of the potent virus introduced into their systems, and

should, with all their belongings, be disinfected, before final liberation. In the case of herds, too, the same precaution is imperative, and on no account should animals kept on uninfected ground be inoculated with these *less potent* germs as a preventive against the *more potent* to which they are to be subsequently exposed in an infected pasturage. Such a course would only be the sowing of a previously wholesome soil with a deadly seed which would be preserved and intensified in any portion of that soil favorable to its maintenance and increase.

The extensive adoption of Pasteur's method of protection against anthrax has undoubtedly been the means of planting that deadly disease on many soils hitherto wholesome and safe, and this evil cannot fail to be extended wider and wider, so long as the method is pursued in the present indiscriminate manner."

"For animals pastured on fields that are already infected, Pasteur's protective inoculation against that infection may be safely allowed, but for those on fields as yet uninfected, but of a nature favorable to the preservation of that poison when planted, such inoculation must be unequivocally condemned. In such a case the animals should be housed for inoculation, or confined to a porous soil that will not preserve the germs, and should only be set free when all danger from living germs within their bodies, has passed, and after a perfect disinfection."

Let this suffice for the present. I have encroached on your space and patience too much for a single communication. What remains to be said as to the remedy may well be reserved for a future occasion. Meanwhile it may be said that the advances in the knowledge of microbian disease since 1887 (over a quarter of a century ago) have been enormous, and for the future we shall be far from helpless. It was needful, however, to clear away some of the inflammable rubbish which has been accumulating around our factory, in order to facilitate the adoption of intelligent precautions against the increasing frequency of future conflagrations.

THE HOG CHOLERA SITUATION IN IOWA

Mr Kenyon, our esteemed junior senator, of Iowa, is creating considerable newspaper comment of late by his scheme to secure a large Federal appropriation to eradicate hog cholera and to place Department of Agriculture or state experts, or both, in each county to look after the hog cholera situation and other live stock matters.

From the reports one would get the idea that there are no veterinarians competent to handle the situation. There are, however, competent practitioners of veterinary medicine in Iowa, several hundred of them, the politicians to the contrary notwithstanding. Many of them have devoted the best years of their life to the practice of their profession and have kept in touch with the developments of the latest therapeutic and surgical advancements, including, among other things, the production and use of antihog-cholera serum.

Under adverse circumstances the veterinarians of this state have done all in their power to aid in control of hog cholera. Our experience has demonstrated our great need to be a proper supervision of the production of the serum, and the elimination of unnecessary obstacles surrounding its distribution, so that when a competent veterinarian needed serum he could get it and would have assurance that it has a definite standard of potency. Then and not until then can we expect to get uniformly satisfactory results, and if Mr. Kenyon's efforts should accomplish these results every veterinarian and hog raiser would appreciate his efforts. Just furnish the competent veterinary practitioner with the right serum and he and the Iowa farmer will take care of hog cholera.

The folly of the act of the last Iowa assembly in establishing a serum plant and then surrounding the distribution of said serum with so much technical requirements is evident on every hand. For instance, the veterinarian, therein admitted as the one competent to use the serum and virus, was denied the privilege of purchasing serum to supply the demands of

his clients. Its distribution is otherwise hampered by fool technicalities (or political red tape) to such an extent that no self-respecting veterinarian, or hog raiser, either, for that matter, could waste valuable time in going through the tomfoolery required to secure serum and virus when the situation demands prompt action.

The production of hog cholera serum and its use this season has demonstrated the inadequacy of our state serum plant and all private plants in the country combined, to meet the extraordinary demands that existed for a time.

On the other hand, the Federal and states authorities may invest a stupendous sum of money in producing serum and the widespread demand for its use may cease, and as serum will not keep indefinitely, much treasure and labor may be wasted. The State of Kansas has experienced this very thing, and but for the demand for serum in other states, their product would have been a loss, and at that much of it was of doubtful potency, because of its age, when shipped into other states for use.

There are now enough serum plants in operation to provide a sufficient amount of antihog-cholera serum to meet any demand that is likely to develop in the future and if the Federal authorities will direct their efforts toward supervising the manufacture and testing of the product of all serum plants, the hardest part of the problem will be solved. Then, by sending out a few competent men to supervise the work, especially qualified and authorized to enforce quarantine and other preventive measures, hog cholera would eventually be under control.

L. U. SHIPLEY.

Sheldon, Iowa.

DEPILATORY POWDER

Barium sulphide	2 parts
Zinc oxide	1 part
Starch, in powder	1 part

Mix and keep dry. When desired for use make into a paste with a little water, and apply to the part from which the hair is to be removed and leave it on for ten minutes. Usually one application is enough, but, if necessary, repeat. Unless the barium sulphide is quite fresh the combination does not work well. Sodium sulph-hydrate, 1 part, and precipitated chalk, 3 parts, also make an excellent depilatory, but, like the foregoing, must be kept absolutely dry.—*Canadian Druggist.*

NEWS ITEMS

THE Wisconsin Agricultural Experiment Station furnished the Live Stock Sanitary Board of that state with seven thousand doses of tuberculin during the three months preceding October 1st. The Experiment Station has a capacity of sixty-thousand doses of tuberculin per year.

—

DR. J. L. SPIKER of Sheridan, Wyoming, has been playing Pied Piper for his home city. His efforts to rid Sheridan of rats, however, were confined to the use of the Pasteur Rat Virus and not to playing upon pipes. As a result the report was circulated that the plague was spreading from rats to chickens and from chickens to man, and the doctor was called upon to do some tall explaining, in the local press, which he did to the satisfaction of his fellow citizens.

—

JOHN HAUSER of Petersburg, Indiana, is reported to have sold Guy Sanders, of the same place, some hogs in the incubative stage of cholera. As a result of thus introducing infection into his herd Sanders lost one hundred head of hogs and was awarded $800 damage by a jury before whom his suit against Hauser was tried.

—

AN ANTIHOG cholera serum plant is now located at Sioux Falls, South Dakota.

—

M. D. MINTZMAN, entomologist of the Philippine Department of Agriculture, has discovered that anthrax may be communicated from one animal

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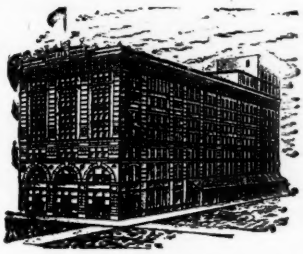

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to another and from animals to man by means of the stable fly.

—

Dr. V. C. White, state veterinarian of Idaho, is charged with holding up a stage near Boise. The purpose of the hold up was not robbery, but the determination whether a report that the stage horses had glanders was well founded.

—

A rabid dog bit a cat, three cows, a mule, a boy and a man near Carbon, Indiana. The animals have all died and the boy and the man have taken the Pasteur treatment. The case is rather unusual, in that all of the animals bitten contracted the disease.

—

Dr. Cliff C. Ackley, deputy state veterinarian of Washington reports a serious loss among horses of the Braynon Mountain districts. The cause of the loss has not been determined, but it is assumed to be some sort of forage poisoning.

—

Dr. F. A. Wolfe of Linneus, Missouri, in his local paper, reports the occurrence of more than one hundred and twenty-five cases of impaction of the colon in horses as a result of their eating dry fodder.

—

Dr. W. C. Cook of Findlay, Ohio, reports the death of a valuable team of horses from locust poisoning.

—

Dr. D. F. Luckey, state veterinarian of Missouri, through the local papers, has warned Missouri armers that the conditions are favorable to the loss of horses from being turned in stalk fields and advises that the animals be not turned on to the stalk fields this season until after January 1st.

—

Dr. C. C. Logan, a 1912 graduate of Iowa State College, has located for practice at Keosauqua, Iowa.

—

Dr. John W. Riegle of Emmitsburg, Maryland, died on November 13, 1913. He had been a sufferer from asthma for years. During the past eighteen months it was complicated with a valvular insufficiency, which caused his untimely end.

Doctor Riegle had been practicing medicine and surgery for nearly thirty-five years. He graduated from the National Veterinary College, of Washington, D. C., in 1894. He was one of the first members of the Examining Board for veterinary licenses in Maryland.

The deceased was one of the most proficient veterinarians in materia medica in the State of Maryland. He had made a study of every branch of medicine—human and veterinary.

His burial was under the direction of the Masonic lodges of Emmitsburg and Thurmont, Maryland. He leaves a widow and two daughters to mourn his loss.

—

Dr. Chas. Schneider has been appointed meat inspector in St. Louis. The doctor formerly practiced in Cassville, Wis.

—

Dr. F. A. Fletcher, formerly of Eugene, Oregon, has located for practice at Weston, Utah.

A NEW FORM

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HYPODERMIC TABLETS

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The Heart Tonic and Stimulant Par Excellence

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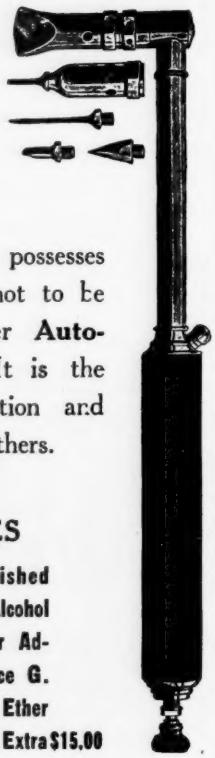

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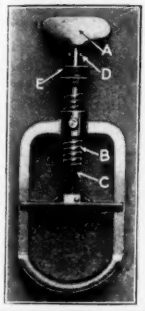
DR. CHAS. B. HOCK, formerly of McConnelsville, Ohio, has accepted the position of assistant state veterinarian of Mississippi. He is located at Jackson, Miss., where he has opened up a hospital with Dr. L. E. Miller as his partner. Both these doctors are graduates of 1912 class of the Veterinary Department of the Ohio State University. Doctor Hock tells us that there is a good opening at McConnelsville for a graduate veterinarian.

—

DR. J. STOKES, a graduate of the McKillip Veterinary College, has decided to establish a veterinary practice at Pecatonica, Illinosi.

—

DR. W. F. CREWE, state veterinarian of North Dakota, has opened an office at Bismarck. He was formerly located at Devil's Lake.



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DR. HARRY S. PEASE, a graduate of the Ohio State University, class of 1913, has located for practice at Canonsburg, Pa.

—

DR. C. A. SCHULZ of Ellsworth, Kansas, has disposed of his practice to Dr. O. E. Strodtman of Arkansas City and has located at Independence, Mo.

—

THE winter meeting of the Missouri Valley Veterinary Association will be held January 27, 28 and 29, 1914, at the Coates House, Kansas City. The prospects for a profitable meeting are good.

—

DR. R. H. WILSON, Rochester, Michigan, has been appointed Chief Veterinarian to Parke, Davis & Company, to succeed Dr. G. W. Dunphy, who has resigned to become state veterinarian.

—

DR. THOS. BROOM, Essex, Ontario, has been confined for six weeks with appendicitis, but has made a complete recovery.

—

DR. FRANCIS HENRY FLAGGE, who formerly practiced veterinary medicine at Blauvelt, N. Y., died at the home of his sister, New Rochelle, N. Y. The doctor was fifty-three years old and had retired from practice for eight years.

—

DR. W. R. STAUFFER of Philadelphia dropped dead as the result of a ruptured blood vessel in the brain, November 23rd. The doctor was fifty years of age and had apparently been in good health up to the time of his death.

DR. J. H. SNODDY of Martin, Tenn. died at his home after a short illness caused from contracting poison. The doctor was sixty-five years of age and engaged in the manufacture of veterinary medicine. He leaves six children.

—

DR. J. M. NORTHCUTT of Rama, Texas, was struck and killed by a train near White Deer, Texas.

—

DR. D. C. MORGAN, formerly of Peebles, Ohio, has leased the veterinary hospital of Dr. R. Clark, Winchester, Ohio, and succeeded him at that place. Doctor Clark has located at Elberton, Georgia.

—

DR. W. F. KAISER announces that he has moved to his new, large, fully-equipped veterinary hospital, 4334 West Madison Street, Chicago, where horses, dogs and cats will receive the advanced scientific and humane treatment.

—

Dr. W. K. YORK, who has been practicing at Auburn for the past two years has moved his office to Johnson, Nebraska.

FEED FANCIES

On the occasion of the transference of Inspector-in-Charge, Dr. F. A. Shipley from South Saint Joseph, Missouri, the employees of the Local Bureau of Animal Industry held

VETERINARY BIOLOGICS

Vaccine Equina--Curative.

Indications: Distemper (Shipping Fever), and its complications, Pneumonia, etc. Over 45,000 inoculations since 1910.

Cures reported 98%. Not improved, 1½% (cases too far advanced).
Mortality, ½%.

Vaccine Equina--Three Point Immunizing.

Indications: Prophylactic against Distemper and its complications.

3,500 inoculations. 3,000 successful inoculations. 400 unsuccessful inoculations. Ultimate results with VACCINE EQUINA--CURATIVE 100%.

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Indications: General Suppurative Conditions, such as infected Wounds, Abscesses, Pharyngitis, Laryngitis, Purpura Hemorrhagica, Fistulas from Necrotic Bone or Cartilage, etc.

Canine Distemper Vaccine--Immunizing and Curative.

Contains the organism of CANINE DISTEMPER, secondary invaders and their aggressins.
Indications: Canine Distemper and its complications.

We desire to call your attention to the above Equine and Canine Vaccines. Three years of continued success has firmly established their efficiency and superiority. The Profession reports ECONOMY TREATMENT, LESSENED MORTALITY, CASES showing LITTLE OR NO LOSS OF CONDITION and NO ABSCESS FORMATION.

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a farewell reception and banquet in his honor.

Dr. C. M. McFarland, chief vody villyan on the force, arranged the menu card which, in K. C. V. C. *Alumnus*, was published thus:

MENU

Rocky Mountain Oyster Cocktail
Hot Cholera Serum in Cups Pathological Milk
Roast Chronic Interstitial Myositis
Potted Hot Tongue Actinomycosis foci
Croquettes Caseous Lymphadenitis
Fried Paunch with Necrobacillosis in Sour Lard
Hashed Brown Lymphosarcoma, Machine Fat Sauce
Hog Digits in Vinegar
"Robert" Veal-stewed (and very groggy) with Septic Omphalophlebitis
Frozen Hair Sores, garnished with Desiccated Margaropus Annulatus
Old Cold Cow, sliced, with Cysticercus Bovis dressing
Chitterlings, rolled in Fertilizer and fried in Rancid Lard
Cold sliced Oesophagus with Spiroptera Scutata
Ropy Pickle Dump-box Skimmings
Tankage Patties Hot Stick Water
Calf Rennets Hog Pepsins
Bile, Pancreatin, q. s. to digest above
Old Bull (Durham) in the Smoke House with Mizzouri Meerschaum Skewers

THE SECRET OUT. HE OWNS A CONKEY TABLE

In a recent number of the journal we read with no little interest an article from the pen of the Secretary of the Wolverine Veterinary Association, of Michigan, stating that Dr. Thorburn, of Lansing, Michigan, a veterinarian possessing only one hand, had spayed a bitch alone and unaided, and did it in regulation time. I at once became a "doubting Thomas," for a one-handed surgeon to perform this feat in regulation time really sounded fishy. However, upon inquiry we have been creditably informed that the Doctor owns a Simplicity Canine and Feline Operating Table, purchased from the Veterinary Specialty Manufacturing Company, of

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Cattle or Horse hide, Calf, Dog, Deer or any kind of skin with hair or fur on. **We tan and finish them right**; make them into coats (for men and women), robes, rugs or gloves when ordered.

Your fur goods will cost you less than to buy them, and be worth more. **Our illustrated catalog** gives a lot of information which every stock raiser should have, but we never send out this valuable book except upon request.

It tells how to take off and care for hides; how and when **we pay the freight both ways**; about our safe dyeing process which is a tremendous advantage to the customer, especially on **horse hides and calf skins**; about the fur goods and game trophies we sell, taxidermy, etc. If you want a copy send us your correct address.

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Successfully used by veterinarians on over 36,000.000 head.
Canine Distemper Serum
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Holland, Michigan. The table accounts for the success of this seemingly impossible feat by a one-handed surgeon. I own one, and can perform any operation on my table, alone, with two hands, but never thought of anyone being able to operate with but one hand.

C. L.

REGULATIONS GOVERNING CONDEMNATION FOR HOG CHOLERA

Amendment to Regulation 13, B. A. I. Order 150 (Regulations Governing the Meat Inspection of the United States Department of Agriculture), Governing the Disposition of Carcasses Affected with Hog Cholera and Swine Plague.

For the purpose of preventing the use in interstate or foreign commerce of meat or meat food products which are unsound, unhealthful, unwholesome, or otherwise unfit for human food, under the authority conferred on the Secretary of Agriculture by the provisions of the act of Congress approved June 30, 1906 (34 Stat., 674), Section 10 of Regulation 13 is hereby amended to read as hereinafter set out.

This amendment, which for purposes of identification is designated as Amendment 5 to B. A. I. Order 150, shall become and be effective on and after November 15, 1913.

B. T. GALLOWAY,
Acting Secretary of Agriculture.

SECTION 10, *Paragraph 1.*—Carcasses of swine shall be condemned for hog cholera or swine plague—

(*a*) When the carcass shows well-marked and progressive lesions in any organ or tissue.

(*b*) When the carcass is that of an animal which plainly showed symptoms of either disease on antemortem inspection.

(*c*) When the carcass is that of an animal which had a temperature of 106° F. or higher and which was of a lot in which symptoms of either disease were apparent; provided, that in case of doubt as to the cause of the high temperature, the animal, after being marked for identification, may be held for a reasonable time by the owner under the supervision of the inspector for further observation and taking of temperature.

Paragraph 2.—Carcasses of animals which did not show on antemortem inspection the symptoms or temperature mentioned in paragraph 1 (*b*) and (*c*) of this section may be passed for lard when the lesions found on postmortem inspection are not sufficiently well marked and progressive to warrant their condemnation under paragraph 1 (*a*) of this section.

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Fine references as to personal integrity and business ability—from four banks, and and dozens of well known concerns, besides hundreds of references from satisfied customers from all parts of the United States.

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ENGLISH BULLDOG AT STUD — IMPORTED "Stonewall Jackson," A. K. C. No. 163156, weight 50 lbs. This grand young dog is well known as a prolific sire of phenomenal puppies. Stud card shows cut and gives full particulars. Write for it. Dalmore Kennels, (Reg.) North East, Pa.

FOR SALE—A VERY LUCRATIVE DOG AND CAT practice in the west. Easily worked with automobile. Returns average $6000 per year for the past three years. Price, $5000 cash, to include everything except my auto and bulldog. Address No. 39, care of VETERINARY MEDICINE.

FOR SALE—MODERNLY EQUIPPED VETERINARY hospital, operating table, instruments, house, all new. Practice well established. Located at county seat. Price upon inquiry. Want to retire from practice. Address Harry E. Martin, Bentonville, Ark.

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WANTED—POSITION AS ASSISTANT OR A GOOD location to practice. Will settle with party if location suits. Dr. H. B. Ballou, North Adams, Mass.

POSITION WANTED—AS ASSISTANT OR TO TAKE charge of a veterinary practice. Large experience and good habits. Address No. 46, care of VETERINARY MEDICINE.

FOR SALE—ESTABLISHED VETERINARY BUSIness in stock yards and in city of 65,000. Address 25 West 10th Street, Oklahoma City, Okla.

THE VETERINARY RED CROSS IS ONE OF THE working tools of the profession. Let everybody know who you are by carrying the insignia of the profession. Price $2.00; two for $3.50. The Alba Medical Company, Middlebury, Indiana.

FOR SALE—DOG AND CAT HOSPITAL AND PRACtice. Long established in Chicago. Monthly returns over $500. Will bear close investigation. Bargain if sold before January 15th. M. F. Cullen, 30 No. Dearborn Street, Chicago, Ill.

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Veterinary Practices furnished and sold in 48 states. Physicians, dentists and nurses furnished and located. Drugstores for sale and drug positions in all states. F. V. Kniest, R. P., Omaha, Nebr. Established 1904. tf.

The Boston Terrier, and all about it, by Edw. Axtell. A practical scientific and up-to-date guide to the breeding, kenneling, rearing, selling, etc., of the American Dog. The largest and most complete book on the subject ever written. Fully illustrated. Beautifully bound in silk cloth. Price $1.50. Send orders to VETERINARY MEDICINE.

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Valuable Papers: A file for your valuable papers, durable and convenient, contains a pocket for each of the following: Business Memoranda and Clippings, Life Insurance Policies, Fire Insurance Policies, Contracts, Notes and Mortgages, Deeds, and Last Will and Testament. Price, 50c. AMERICAN JOURNAL OF VETERINARY MEDICINE.

Stories of a Country Doctor, by Willis P. King, M. D. Just the thing for leisure hours. It is brim-full of wit and side-splitting fun, and pathos. Among its chapters are: Education and Pioneer Schools, Old-Time Dances and Parties, Civilization and Pioneer Weddings, Preacher Doctors, Mediums and Nurses, Deathbed Repentance and Confessions, Sham Suicides, Liars and their Lies, Consultations and their Code, People Who Annoy Doctors, Quacks and Quackery, and many others. Bound in cloth, 400 pages, many illustrations, $1.00 prepaid. Order from VETERINARY MEDICINE.

The Exploits of a Physician Detective, by Geo. F. Butler, M. D. Each story has a basis in fact selected from incidents in the author's extensive practice, and is entirely plausible. They treat crime largely from the alienist's viewpoint and Doctor Furnivall, the detective, is a character even more interesting than Sherlock Holmes. His methods are entirely different from those of that celebrated character of detective fiction. These stories open a new line in detective fiction and are absorbingly interesting. 400 pages, bound in cloth, price $1.00. Order from VETERINARY MEDICINE.

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The Letters of Dr. Betterman. A series of eleven letters from an old doctor to his son just beginning practice. In them many questions are discussed which confront and often baffle the young practitioner; full of the philosophy of cheer and uplift that will hold your attention from the first to the last chapter. And you will surely be better for having read this book. Art poster cover, 140 pages, regular price 75c. Our special price, 50 cents prepaid. Send orders to VETERINARY MEDICINE.

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The original **Beebe Anti-Influenza Vaccine,** of superior efficiency, has been paid the highest compliment by its several imitations now on the market.

It has proven its merits in the prevention and treatment of Influenza, Strangles and Shipping Fever—for which it is The Ideal Preparation.

Its success with others justifies your confidence.

July 25, 1913

Dr. W. L. Beebe,
St. Paul, Minn.

Dear Doctor:

Would advise you it gives me great pleasure to recommend your Influenza Vaccine to the veterinary profession at large. I have used it in a great many stables where influenza has made its appearance and the results I have attained have been very pleasing to my client and myself. I wish you the best of success with it, and cheerfully recommend it to every practicing veterinarian as a great asset to his business.

Thanking you, I remain,
D. J. Holton, V. S.,
Waseca, Minn.

Watch for the Recommendation of others

Recommended for use only by the Veterinary Profession.

PRICES

Single dose	**$0.50**
Four doses	**1.50**
Twelve doses	**4.00**

Beebe Biological Laboratories
St. Paul, Minn.

The drug business, retail, wholesale, salesman and ten years in this line have in a manner fitted him for the business.

Furnish physicians, veterinarians, clerks and dentists where there is a demand or opening for them.

This agency is of high value to the wholesale and retail drug trade if they only look into the services furnished.

Gilt edge references and strictly high grade, clean, honorable service and investigation asked.

WANT ADS SUCCESSFUL

I AM well satisfied with the little advertisement that I run in the classified list. I want nothing better. I received forty-five answers last month and they are coming along nicely this month.

Winfield, Kansas. I. G. WIMSETT.

TRANSPLANTING PART OF THE SCALP

Perimoff reports the case of a man with a deforming cicatrix in the right side of his head, who made an arrangement with a Mohammedan for a transplanting operation, paying the latter for a part of his scalp; Mohammedans always keep their heads covered. Both were anesthetized with chloroform at the same time. The cicatricial area was cut out down to the periosteum and was replaced with the flap from the other scalp. It healed perfectly in place, the hairs did not fall out and continued to grow apparently normally. The areas had been cleaned only with soap and warm water, and Perimoff thinks that the failure of others in similar operations may have been due to the over-vigorous sterilization of the graft. The skin of dogs does not fit to the scalp so well.—Zeutr. für Chirur. Leipsic Abst. in *J. A. M. A.*

CURE IN HYDROPHOBIA

In a case of rabies cited by Haberlin, 10 Cc. of 1 percent aqueous solution of phenol were injected into the subcutaneous tissues of the abdominal wall by means of an Ehrlich-Hata syringe at 8:30 p. m. on the day of the attack, which occurred five weeks after the dog bite. At 9:00 p. m. 10 Cc. of a 2 percent solution were injected similarly and repeated in an hour. At 11:00 p. m. there was a very perceptible improvement in the patient's condition. Hourly doses of the 1 percent solution were now resumed and administered until 8:00 a. m. A total of eleven doses, therefore, of the 1 percent solution and two doses of the 2 percent solution were administered, or, in the aggregate, an equivalent of 1 1-2 Grams (22 1-2 grains), of pure phenol. At 2:00 a. m., six hours after beginning treatment, the patient became somnolent, and when aroused was able to swallow readily. At this hour he was aroused for the first time by the insertion of the large caliber needle. He stated that he now was conscious of his surroundings for the first time since early evening, and when reminded of his previous actions and statements denied any realization of them. He was catheterized at 2:00 a. m., about 8 ounces of urine being recovered, which contained a trace of albumin, but was otherwise normal. He did not require catheterization again, and subsequent specimens were normal. On the fourth day the patient was out of doors, and on the sixth day resumed work, there being no further sequela

than a few days' prostration, which reasonably may be ascribed to excess muscular activity. There were no evidences, locally or generally, of any deleterious effects of the exhibition of the phenol. —*New York State Journal of Medicine* Abst. in *J. A. M. A.*

A LARGE PART OF ROAD BUILDING FUNDS WASTED

The Office of Public Roads of the Department of Agriculture is making a strong effort to focus the mind of the country on the fact that maintenance and effective repair are of equal importance with the actual improvement of bad roads. Investment of money in new roads does not become real economy until provision is made for keeping these new roads in condition after they are built. If a new road was built and then allowed to fall into disrepair, much of the original investment is simply wasted.

Europe, generally speaking, is ahead of the United States in the matter of road improvement, but Great Britain is struggling with a problem similar to the one that confronts the people of the United States. In England, Scotland and Wales there are no fewer than 2140 separate authorities who, between them, administer 175,487 miles of roads, or an average of only 82 miles apiece. In Scotland, apart from the big cities there are over 200 burghs, one-half of which have but 10 miles of road apiece to maintain. Needless to say, such a minute mileage is insufficient to keep the road plant fully occupied all the year around, and renders the employment of a skilled engineer impossible for economical reasons.

Officials of the Office of Public Roads when called upon for assistance by the various states are pointing out that road building is an art based on a science, and that trained men and experienced men are necessary to secure the best results from the expenditure of road funds.

Statisticians have found that although the average expenditure on the improvement of roads exceeds one million dollars a day, a large portion of the money in the United States is wasted because of the failure to build the right type of road to meet the local requirements or the failure to provide for the continued maintenance of the improvement.

OXYNOLEUM **An Improved Moist, Antiseptic Surgical Dressing that Reduces Inflammations.**

A successful treatment for summer sores, jack sores, exhuberant granulations, decubital sores, ulcers, chafing, inflammatory skin diseases, eczema, acne, ringworm, etc., etc.
Superior to all other dressings in the property of evolving oxygen slowly and continuously.

Price per one-pound can prepaid, $1.25
Send for formula and literature

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Filling aseptic glass syringes with the finished antitoxin

TETANUS CAN BE AVOIDED
ONLY BY THE USE OF ANTITETANIC SERUM

The usual antiseptic precautions are insufficient to prevent infection by tetanus bacilli, the spores of which resist all ordinary antisepsis. Antitetanic serum used *before* the attack is 100% perfect as a preventive; used during the attack it is often a valuable treatment.

Our tetanus antitoxin is of the highest quality yet attained by any manufacturers, it is freed from *all* waste and accurately standardized. Use it in all cases of "suspicious" wounds, it is inexpensive insurance against loss from tetanus.

908	**Tetanus Antitoxin,** 750 units in syringe containers	**$0.75**
909	**Tetanus Antitoxin,** 1500 units in syringe containers	**1.25**
910	**Tetanus Antitoxin,** 3000 units in syringe containers	**2.50**

Used on the day of infection or within 48 hours thereafter 750 units is a safe prophylactic dose.

THE ABBOTT ALKALOIDAL COMPANY
[THE ABBOTT LABORATORIES]
Ravenswood, CHICAGO

The various states and counties within the past six months have taken a greater interest in road improvement than ever before in the history of the United States, and there is now a strong movement to conserve the roads of the country where they are improved. Scientific maintenance will be one of the chief features of the work of the Office of Public Roads throughout the present year.

No class except possibly rural mail carriers use the roads more than veterinarians, who should be interested in and a part of every movement for the betterment of country roads. Be a missionary and an enthusiastic one in this work.

WHEN GREEK MEETS GREEK

Down in Spartanburg, South Carolina, a city that has recently been put on the veterinary map by Dr. B. F. Kaupp, a frequent contributor to this journal, there is a veterinary practitioner, who, possibly because of the enlightenment brought about by Doctor Kaupp and others, is probably finding his practice in a bad way and with the usual versatility of his class, is now endeavoring to break into politics. The office in view being that of City Commissioner, which pays an annual salary of $1000, and which he is endeavoring to obtain by means of public speeches and large cards, containing his photo, the promise to devote his whole time to the city and the following touching little poem:

1

Many a horse has been killed by a quack
And many a cowhide hung on the rack,
All for the want of a doctor that knew
Just how to dose them and just what to do.

2

On account of the aldermen they have had,
Many a city has gone to the bad;
Many a dollar of people's money spent
And no way of telling which way it went.

3

Just for that reason, and no other thing,
I've thrown my old hat right out in the ring,
So give me your votes and see if we can
Elect for Commissioner the Horse Doctor Man.

4

So many votes have been cast for the rich,
Keeping the poor man down in the ditch.
I want the office to keep the wolf from the door;
Come hear me speak and I'll tell you some more.

The Horse Doctor Man.

P. S.—Will speak at night at the Mills and Court House.

One of our friends at Clemson College, for the sake of truth, submits the following paraphrase of the poetry quoted, a matter which will doubtless meet with the disapproval of the new-found politician:

1

Many a horse has been killed by this quack
And many a cowhide he has hung on the rack,
All because he never knew
How to treat them or what to do.

2

Perhaps some cities have gone to the bad
On account of aldermen they have had;
Spartanburg, however, is not an example,
As in this city is proof most ample.

The Bane of Veterinarians

INFLUENZA, Shipping Fever, Strangles and Contagious Pneumonia are now successfully prevented and treated with LEDERLE'S Equine Influenza Prophylactic and LEDERLE'S Equine Influenza Treatment—Polyvalent Vaccines of proven efficiency.

Samples cheerfully sent on request.

Lederle Antitoxin Laboratories

Schieffelin & Co., Distributors,
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BANNERMAN'S INTRAVENOUS SOLUTION

A Nostrum First Exploited as a Consumption Cure—Now as a Cure-all

Veterinary medicine, apparently, does not present the opportunity for quackery that are to be found in the treatment of human beings. The probable reason for this is that livestock is valuable and its owners are not willing to take chances. Human life is cheap, and the protection it is accorded, small. These facts may explain why veterinarians with quackish tendencies go into the "consumption-cure" business. In this connection our readers will recall Eckman's Alterative, a fraudulent consumption cure put on the market by a veterinarian, and Yonkerman's Tuberculozyne, another equally fraudulent consumption cure, put out by a horse doctor.

Bannerman's Intravenous Solution is said to be the "discovery" of William Bannerman of Chicago. Bannerman is a veterinarian who claims to have "spent over twenty years in the experimental field, among the lower animals, where he found all the different diseases that man is heir to." "My fight," he declares, "was to cure the great white plague," and at last he found, so he says, "a remedy that may be instrumental in driving from the land the dreaded White Plague."

To summarize, here are the facts regarding the Bannerman product:

1. It is put on the market by a man who is neither a physician nor a pharamcist and whose only claim to medical knowledge is that of being a veterinarian.
2. It was first exploited as a cure for consumption and has been known by the various names, "Tubercular Solution," "Germicidal Solution," and "Intravenous Solution." It is now sold as a cure-all.
3. Its composition is secret.
4. A fake formula is published that is meaningless to physicians and absurd to chemists.
5. The claims made for it are both false and fraudulent.
6. It is, in short, a product whose use appeals chiefly to cupidity and ignorance.—*The Journal of the American Medical Association.*

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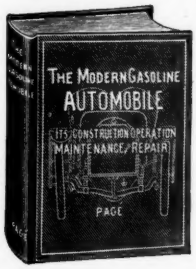
The Modern Gasoline Automobile



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500 Illustrations—Over 700 (6 x 9) Pages—Ten Large Folding Plates

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A COMPLETE AUTOMOBILE BOOK, SHOWING EVERY RECENT IMPROVEMENT

By a careful study of the pages of this book one can gain practical knowledge of the automobile that will save time, money and worry. The book tells you just what to do, how and when to do it. Nothing has been omitted, no detail has been slighted. Every part of the automobile, its eqiupment, accessories, tools, supplies, spare parts necessary, etc., have been discussed comprehensively. If you are, or if you intend to become a motorist, or are in any way interested in the modern Gasoline Automobile, this is a book you cannot afford to be without.

Covers Every Phase of 1913 Automobile Practice and is Superior to Any Treatise Heretofore Published

WHAT IS SAID OF THIS BOOK

"It is the best book on the Automobile seen up to date."—J. H. PILE, Associate Editor, *Automobile Trade Journal*.

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"Mr. Page has done a great work, and benefit to the Automobile Field."—W. C. Hasford, Mgr. Y. M. C. A. Automobile School, Boston, Mass.

"It is just the kind of a book a motorist needs if he wants to understand his car."—*American Thresherman.*

Sent prepaid on receipt of price.

American Journal of Veterinary Medicine 1761 Lawrence Ave. CHICAGO, ILL.

3
He needs "the bones" the office pays
To add to his income from "Quackery ways";
Just for this reason and no other thing
Let's kick the Hoss Doctor's hat from the ring.

4
His frank confession of poverty near
Need cause the poor no unnecessary fear
As for many years with "salves and lotions"
He will beguile from the public a generous portion.
(With apologies to the original author.)

SUCCESSFUL PUPPY FEED

Great care must be exercised not to overfeed puppies at weaning. They always seem hungry at this time and the tendency is to feed them too much, thus overtaxing their digestion. From weaning (say four weeks of age) to two and one-half months of age puppies do well fed on malted milk with cream and shredded wheat biscuit.

SALT FOR CHICKENS

It does not seem to be generally known that an excess of salt will kill chickens, and very frequently we get word from people who have had the experience of losing large numbers of chickens from simply giving them too much salt.

This is never done deliberately, but comes about in a most innocent way. For instance, one woman baked a cake and made the mistake of putting in salt instead of sugar. When the error was discovered, it was of course found that the cake was unfit to eat, and as a consequence it was thrown to the chickens. Practically all of the chickens died as a result.

In another case, some ice cream was ordered and the salty water which was left in the freezer was poured into the chicken feed, with the result that the next morning practically all of the lady's chickens were dead.

So we might go on with these instances, but this is enough to show what the deadly effects are when chickens get too much salt. Chickens will seldom deliberately eat salt in its pure form, or drink enough salt water to kill them, but when it is mixed with their food, it nearly always proves fatal.

It would seem that a little more publicity would save a great many more chickens.

I. E. NEWSOME.

Ft. Collins, Colo.

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For prospectus and other information, address the President.

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ANTIHOG CHOLERA SERUM

Get it at its best

We take the blood from the hyperimmune when it contains the most antibodies and, therefore is highest in potency.

We do not bleed from the tail at different intervals, getting serums of various degrees of strength, but we kill the hog when his hyper-immunity has reached the highest point and take all the blood at one time. That is why our serum gives such universal satisfaction.

Our serum is a positive immunzing agent and stands high as a curative.

One trial will convince you. Let us give you further information and prices.

Missouri Valley Serum Company

809 Live Stock Exchange Building KANSAS CITY, MO.

Dr. G. I. Blanchard, Pres. Dr. E. B. Hollecker, Sec. and Treas.